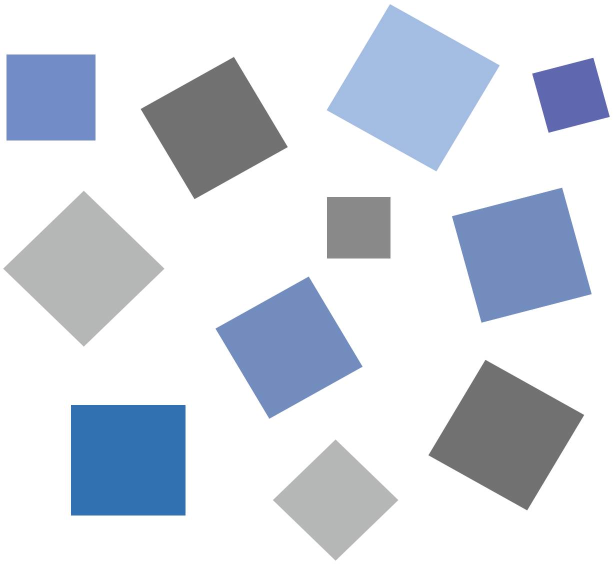
GL-Connection (GL-Config)

Application software

USER'S MANUAL

MANUAL NO. APS(GL-Connection)-UM-151



GRAPHTEC

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1. PREFACE

This is the user's manual for the GL-Connection application software and the GL7000 management software, GL-Config. Set up the software according to the following procedures depending on the application environment.

- For customers who will not use the GL7000 Display Module
  Step 1: Install the USB driver from the CD-ROM (if using a USB connection)
  Step 2: Configure the LAN and USB ID settings in GL-Config.
  Step 3: Install and open GL-Connection.

- For customers who will use the GL7000 Display Module and GL-Connection
  Step 1: Install the USB driver from the CD-ROM (if using a USB connection)
  Step 2: Configure the LAN and USB ID settings on the GL7000.
  Step 3: Install and open GL-Connection.

- For customers who will use the GL7000 Display Module and will not use GL-Connection
  Step 1: There is no need to install GL-Config and GL-Connection.

1-1. About GL-Config

The GL-Config application software is a software for GL7000 that manages by connecting the GL7000 to a PC.
This software is necessary for configuring transmission settings for the GL7000, especially when the GL7000 Display Module is not used.
The main features of GL-Config are as follows. (* A USB connection is required for all features other than firmware version upgrades)

1) USB ID settings and reference
2) LAN settings and reference
3) Version reference
4) Device formats (built-in flash, SD Card, and SSD Module)
5) USB drive mode device changes
6) Firmware version upgrades

1-2. About GL-Connection

The GL-Connection application software is software used to perform USB and LAN connections with the GL, to configure GL settings, and to carry out data recording, data playback and real-time display of input signals. The main functions of GL-Connection are as follows.

1) Multiple module connections to the GL device: Connect up to 10 modules mixing USB and LAN connections.
2) Automatic recognition of the GL device: Automatically recognizes a GL connected to a PC and displays a device icon. Connections are possible with one click.
3) Waveform and digital displays: There are diverse display options including digital values, and Y-T and X-Y displays.
4) Multi-screen functionality: Simultaneously displays different waveforms on up to 4 screens.
5) Data recording function: Records in realtime on the PC with sampling of up to 1 ms in GBD (binary) or CSV (text) formats. Recording is possible (*There are limits to the sampling according to conditions)
6) Data playback function: Plays back recorded GBD (binary) and CSV (text) formatted files. Data recorded on the PC using this software can be played back at high-speed due to data compression.
7) Statistical calculation function: Displays the maximum value, minimum value, average value, peak value and the root mean squared value (*for playback data only) for both real-time and playback data.
8) Group function: A useful function that multilaterally displays the signal and playback data for one device.
9) E-mail notification function: A function that sends mail to a specified address when an alarm occurs due to the alarm function.
10) Direct Excel function: A function that transfers recorded data directly to Excel. Template file path creates a data file with a free format using a template file.
11) Synchronization and simultaneous connection functions: Records data without error using sync cables between multiple GL7000 modules. Also simultaneously starts recording even if the device doesn't support the sync cable.
(*Simultaneous recording may produce data errors)

2. Operation Environment for GL-Config and GL-Connection

Install the software on a PC that meets the following requirements.

Item	Necessary Conditions
OS	Windows XP (SP2 or higher) or Windows Vista (32-Bit/64-Bit) Windows 7 (32-Bit/64-Bit) (*Starter Edition not supported)
CPU	Pentium 4: 1.7 GHz or higher
Memory	512 MB or higher (1 GB or higher is recommended)
HDD	200MB (1 GB recommended) of empty hard drive space is needed to install the software.
Display	Display 800x600 resolution or above, 65,535 colors or more (16-Bit or above)
Others	USB port, an Ethernet port and a CD-ROM drive (when installing from CD) are necessary. Microsoft Excel (For using the Direct Excel function)

＊ CHECKPOINT

*There are occasions when recording cannot be performed normally due to recording settings or the condition of the PC (such as if another application is running or if there is not enough free space for the recording medium) even if the PC in use has met the operating environment requirements for measured data recording. Close all other applications and record data on an internal hard disk when recording data.

*Do not launch any other applications when using this software. Also do not execute processes or operations other than this software as much as possible. (Ex: screen savers, virus scanners, file copying or moving processes, file search processes, etc.)

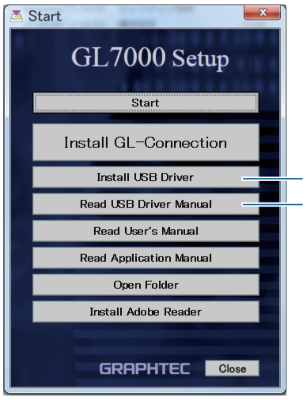
＊ Registered trademarks

*Microsoft and Windows are registered trademarks or brands of the US Microsoft Corporation in the USA and other countries.

*Other company names and product names mentioned here are registered trademarks or brands of their respective companies.

3. Installing the USB driver

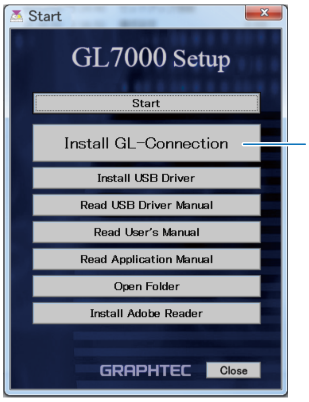
Installing the USB driver is necessary if connecting GL-Config and/or GL-Connection using USB. USB driver installation will begin when selecting the automatic "USB driver installation" program on the attached CD-ROM. Launch MultiSetup.exe on the CD-ROM if the program doesn't launch automatically. For details, refer to the “Read the USB driver installation instructions” in the user's manual.


Start
GL7000 Setup
Start
Install GL-Connection
Install USB Driver
Read USB Driver Manual
Read User's Manual
Read Application Manual
Open Folder
Install Adobe Reader
GRAPHTEC
Close

Installing the USB driver
Read the instruction manual for installing the driver

4. Installing GL-Config and GL-Connection

GL-Config and GL-Connection are installed together. One cannot be installed independently.
The GL-Connection installer will launch and the installation will begin when selecting the automatic "GL-Connection Installation" program on the attached CD-ROM. Launch MultiSetup.exe on the CD-ROM if the program doesn't launch automatically. Continue following the instructions from the installer from this point on.


Start
GL7000 Setup
Start
Install GL-Connection
Install USB Driver
Read USB Driver Manual
Read User's Manual
Read Application Manual
Open Folder
Install Adobe Reader
GRAPHTEC
Close

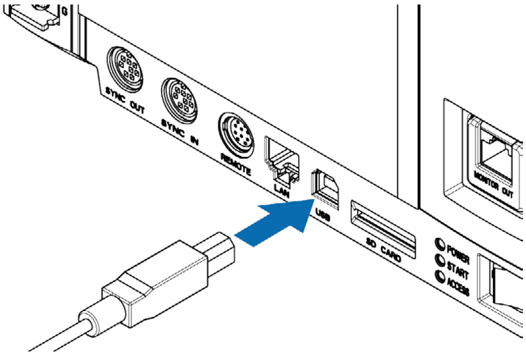
Installing GL-Connection

＊ Be careful of the following points when connecting a GL device to a PC.
*Install using an administrator level account.
*Do not connect anything other than the mouse and the keyboard to the PC's USB connection terminals.
*Set the PC's energy saving function to Off.
*Set the screen saver to Off.
*Set the PC so that it does not go to sleep.
*Notebook PCs may go into stand-by mode when the LCD (screen) is closed, so be sure that it doesn't go into stand-by mode when the LCD is closed when using this software.
*Set virus and security software's automatic update function, and Windows' automatic update functions to Off.

5. How to connect to a PC

5-1. Connecting using USB

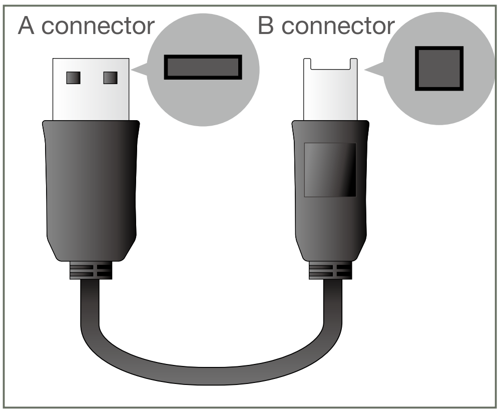
This explains how to connect using a USB cable.


SYNC OUT
SYNC IN
REMOTE
LAN
USB
SD CARD
POWER
START
ACCESS
MONITOR OUT

* CHECKPOINT

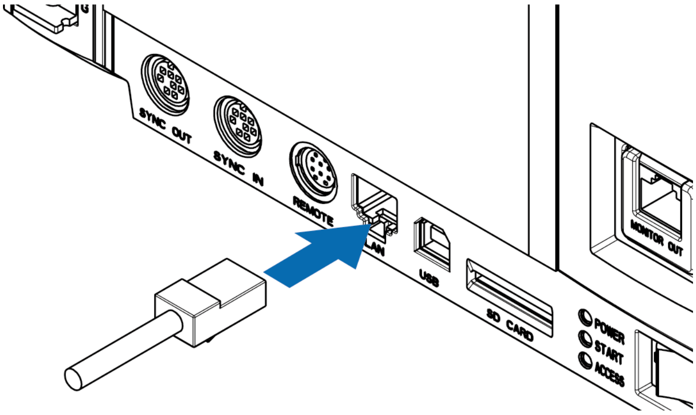
*Installing the USB driver on the PC is necessary when using a USB cable to connect.
Refer to the "USB driver installation instructions" regarding the installation methods.
*Be sure not to mistakenly insert the USB cable into the wrong terminal since it is adjacent to the LAN connector.

Use an A-B-type cable when connecting the device to the PC.


A connector
B connector

5-2. Connecting using a LAN

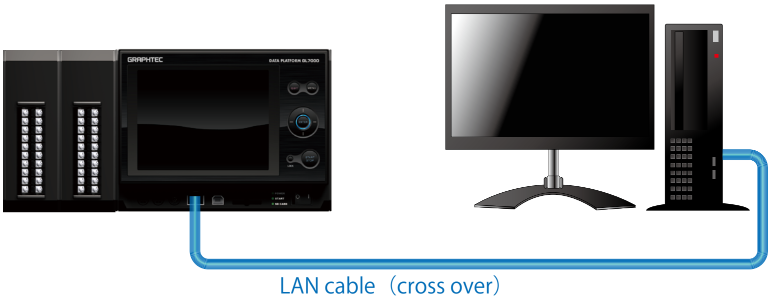
This explains how to connect using a LAN cable.


SYNC OUT
SYNC IN
REMOTE
LAN
USB
SD CARD
POWER
START
ACCESS
MONITOR OUT

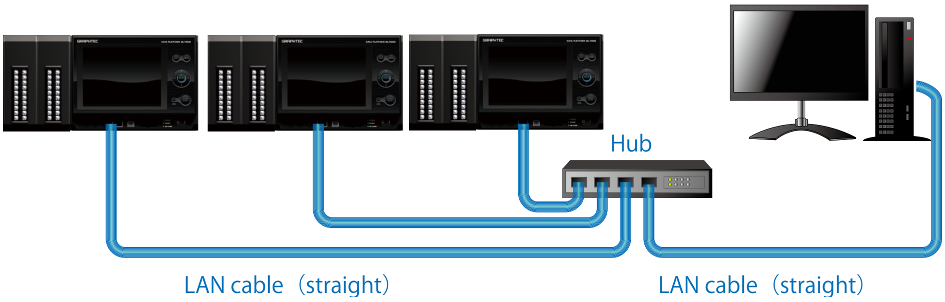
Use the following type of LAN cables depending on the usage context.

- Types of LAN cables

Use a cross over cable if connecting directly to the PC without the use of a hub.


GRAPHTEC
LAN cable（cross over）

Use a straight cable if using a hub to connect to a PC.


Hub
LAN cable（straight）
LAN cable（straight）

* Use a LAN cable of Category 5 (Cat5) type or later.

5-3. Setting the USB ID or the IP address

Configure the GL device's I/F settings in order to connect it to the PC.

5-3-1. When setting using GL-Config

You can configure the LAN settings and USB settings using the GL-Config software packaged with GL-Connection. Please refer to “6. GL-Config” on page 13.

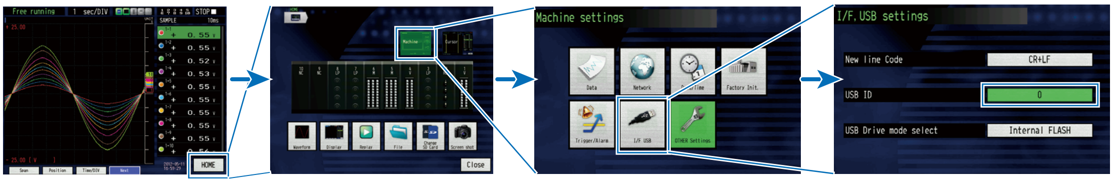
5-3-2. When setting using the Display Module

Configures LAN and USB settings using the Display Module options.

5-3-2-1. USB Settings

Set the USB ID. It can be set between 0 and 9. Assign separate numbers for each GL device so that the USB IDs do not overlap when connecting multiple GL devices with USB.

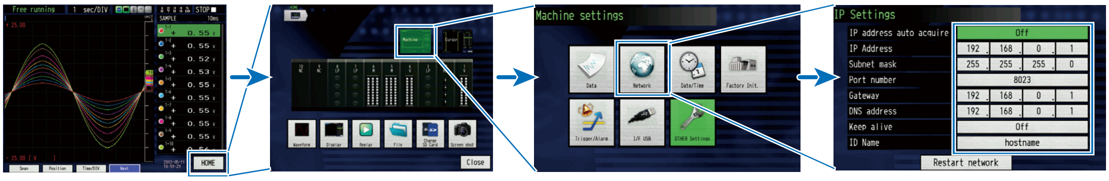
1. Click [Home] on the bottom-right corner of the screen or press the [Home] key from the launch screen.
2. Click [Main Module] on the screen.
3. Click [I/F USB Settings] on the screen.
4. Set the number by clicking the [USB ID] number section.


(1) (2) (3) (4)
Free running
HOME
Machine
Close
Machine settings
Data
Network
Date/Time
Factory Init.
Trigger/Alarm
I/F USB
OTHER Settings
I/F, USB settings

New line Code: CR+LF
USB ID: 0
USB Drive mode select: Internal FLASH

5-3-2-2. LAN Settings

1. Click [Home] on the bottom-right corner of the screen or press the [Home] key from the launch screen.
2. Click [Main Module] on the screen.
3. Click [Network Settings] on the screen.
4. Change each of the network settings.


(1) (2) (3) (4)
Free running
HOME
Machine
Close
Machine settings
Data
Network
Date/Time
Factory Init.
Trigger/Alarm
I/F USB
OTHER Settings
IP Settings
Restart network

IP address auto acquire: Off
IP Address: 192 . 168 . 0 . 1
Subnet mask: 255 . 255 . 255 . 0
Port number: 8023
Gateway: 192 . 168 . 0 . 1
DNS address: 192 . 168 . 0 . 1
Keep alive: Off
ID Name: hostname

Configure the LAN settings to match the network environment for each PC in use. Refer to the main module user’s manual on CD-ROM for a detailed explanation of the LAN setting parameters.

*The IP address can be acquired automatically if a DHCP server is being used in the identical network segment and if it uses automatic IP address acquisition.

5-3-3. PC TCP-IP Settings

Refer to the following settings when connecting one PC to one GL device (when not connecting to a network such as an internal company LAN). Connect the GL device to the PC using a crossover cable.

PC IP address	192.168.1.1
GL device IP address	192.168.1.2

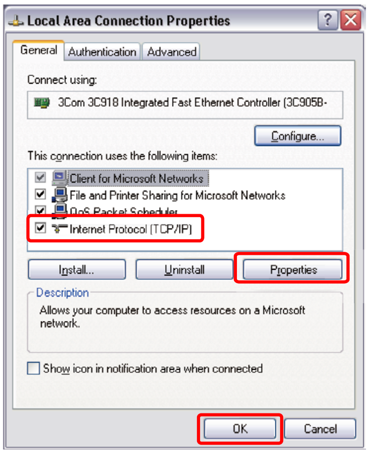
* CHECKPOINT

Set the subnet mask normally in this case to "255.255.255.0".

Set the port number normally in this case to "8023".

5-3-3-1. PC IP Address Settings (for Windows XP)

[Start Menu] → [Control Panel] → [Network Connections] → [Local Area Connections] → [Properties] → [Internet Protocol (TCP/IP)] → [Properties] → Check "Use the following IP address" → Set the [IP Address] and [Subnet Mask] fields → [OK]


Local Area Connection Properties
General
Authentication
Advanced
Configure...
Install...
Uninstall
Properties
Description
OK
Cancel

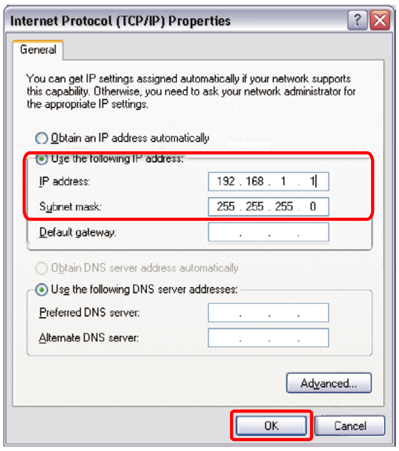
Connect using: 3Com 3C918 Integrated Fast Ethernet Controller (3C905B-

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ Internet Protocol (TCP/IP)

Allows your computer to access resources on a Microsoft network.

☐ Show icon in notification area when connected


Internet Protocol (TCP/IP) Properties
General
Advanced...
OK
Cancel

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 1 . 1

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

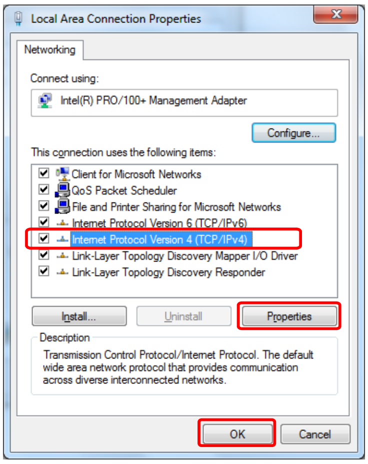
Alternate DNS server: . . .

5-3-3-2. PC IP Address Settings (for Windows Vista)

[Start Menu] → [Control Panel] → [Network and Sharing Center] → [Local Area Connections] → [Status Window] → [Properties] → [Internet Protocol (TCP/IP)] → [Properties] → Check "Use the following IP address" → Set the [IP Address] and [Subnet Mask] fields → [OK]

5-3-3-3. PC IP Address Settings (for Windows 7)

[Start Menu] → [Control Panel] → [Network and Sharing Center] → [Local Area Connections] → [Properties] → [Internet Protocol (TCP/IP)] → [Properties] → Check "Use the following IP address" → Set the [IP Address] and [Subnet mask] fields → [OK]

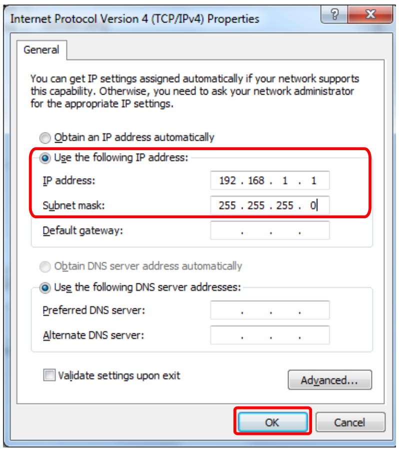

Local Area Connection Properties
Networking
Configure...
Install...
Uninstall
Properties
Description
OK
Cancel

Connect using: Intel(R) PRO/100+ Management Adapter

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.


Internet Protocol Version 4 (TCP/IPv4) Properties
General
Advanced...
OK
Cancel

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 1 . 1

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

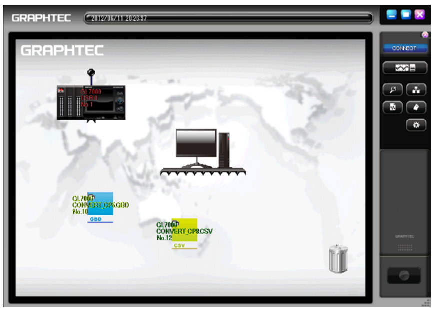
☐ Validate settings upon exit

6. GL-Config

6-1. Launching and terminating GL-Config

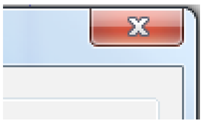
6-1-1. Launching

Launch the software by choosing "Start" on the OS taskbar → "Programs (All Programs)" → "Graphtec" → "GL-Connection" → "GL-Config". The following screen will display when it's finished launching.


GRAPHTEC
2012/06/11 20:26:37
GRAPHTEC
CONNECT
GL7000
USB:0
No 1
GL7000
CONVERT_CP6.GBD
No.10
GBD
GL7000
CONVERT_CP8.CSV
No.12
CSV

6-1-2. Terminating

Click the [X] button on the title bar to terminate the program.

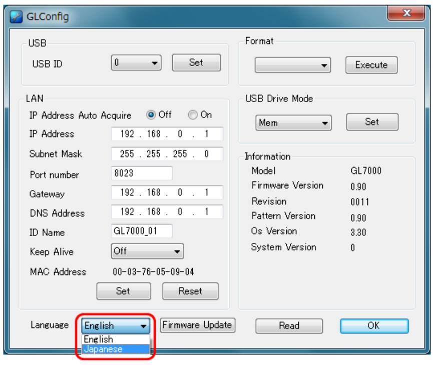


6-2. Changing the Display Language

Changes the display language for GL-Config to English or Japanese (the initial setting is English).

Step 1. Launch the software following instructions in “6-1. Launching and Terminating GL-Config”.

Step 2. Change the language by selecting Japanese or English from the "Language" menu.


GLConfig
USB
Format
Set
Execute
LAN
USB Drive Mode
Set
Information
Set
Reset
Firmware Update
Read
OK
English
Japanese

USB ID: 0
IP Address Auto Acquire: ● Off ○ On
IP Address: 192 . 168 . 0 . 1
Subnet Mask: 255 . 255 . 255 . 0
Port number: 8023
Gateway: 192 . 168 . 0 . 1
DNS Address: 192 . 168 . 0 . 1
ID Name: GL7000_01
Keep Alive: Off
MAC Address: 00-03-76-05-09-04
USB Drive Mode: Mem
Model: GL7000
Firmware Version: 0.90
Revision: 0011
Pattern Version: 0.90
Os Version: 3.30
System Version: 0
Language: English

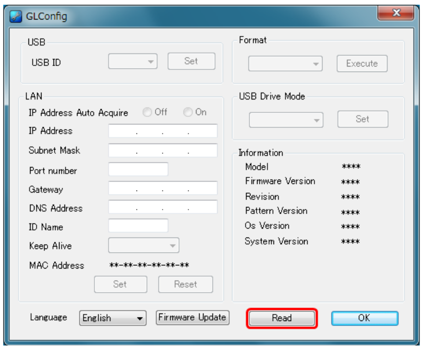
6-3. How to Change the USB ID

Set each GL7000 main module USB ID one at a time using GL-Config before launching GL-Connection when connecting using USB cables and USB hubs to connect multiple GL7000 main modules (up to 10 modules) to one PC. Be sure not to overlap each GL7000 main module USB ID when doing this.

Step 1. Connect one GL7000 main module to the PC using a USB cable, and plug in the GL7000 main module's power source.

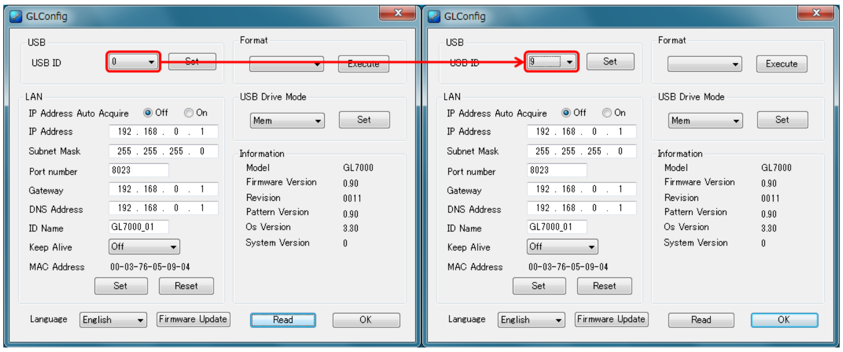
Step 2. Launch the software following instructions in “6-1. Launching and Terminating GL-Config”.

Step 3. Select "Read" to establish communication with the GL7000.


GLConfig
USB
Format
Set
Execute
LAN
USB Drive Mode
Set
Information
Set
Reset
Firmware Update
Read
OK

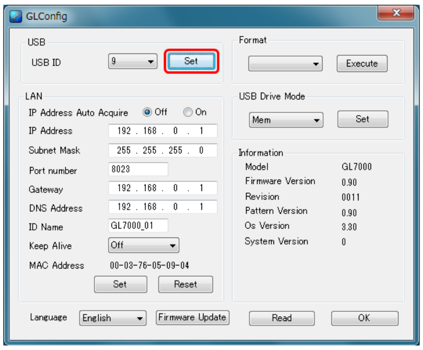
USB ID:
IP Address Auto Acquire: ○ Off ○ On
IP Address: . . .
Subnet Mask: . . .
Port number:
Gateway: . . .
DNS Address: . . .
ID Name:
Keep Alive:
MAC Address: **-**-**-**-**-**
Model: ****
Firmware Version: ****
Revision: ****
Pattern Version: ****
Os Version: ****
System Version: ****
Language: English

Step 4. The current GL7000's USB ID will be displayed, so change it to the appropriate value.


GLConfig
USB
Format
Set
Execute
LAN
USB Drive Mode
Set
Information
Set
Reset
Firmware Update
Read
OK

USB ID: 0 → 9
IP Address Auto Acquire: ● Off ○ On
IP Address: 192 . 168 . 0 . 1
Subnet Mask: 255 . 255 . 255 . 0
Port number: 8023
Gateway: 192 . 168 . 0 . 1
DNS Address: 192 . 168 . 0 . 1
ID Name: GL7000_01
Keep Alive: Off
MAC Address: 00-03-76-05-09-04
USB Drive Mode: Mem
Model: GL7000
Firmware Version: 0.90
Revision: 0011
Pattern Version: 0.90
Os Version: 3.30
System Version: 0
Language: English

Step 5. Select "Set", and apply settings to the GL7000.


GLConfig
USB
Format
Set
Execute
LAN
USB Drive Mode
Set
Information
Set
Reset
Firmware Update
Read
OK

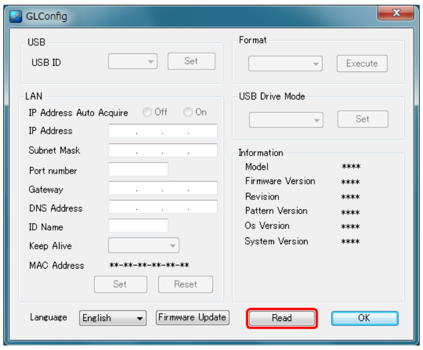
USB ID: 9
IP Address Auto Acquire: ● Off ○ On
IP Address: 192 . 168 . 0 . 1
Subnet Mask: 255 . 255 . 255 . 0
Port number: 8023
Gateway: 192 . 168 . 0 . 1
DNS Address: 192 . 168 . 0 . 1
ID Name: GL7000_01
Keep Alive: Off
MAC Address: 00-03-76-05-09-04
USB Drive Mode: Mem
Model: GL7000
Firmware Version: 0.90
Revision: 0011
Pattern Version: 0.90
Os Version: 3.30
System Version: 0
Language: English

6-4. How to Configure LAN-related Settings

Step 1. Connect one GL7000 main module to the PC using a USB cable, and plug in the GL7000 main module's power source.

Step 2. Launch the software following instructions in “6-1. Launching and Terminating GL-Config”.

Step 3. Select "Read" to establish communication with the GL7000.

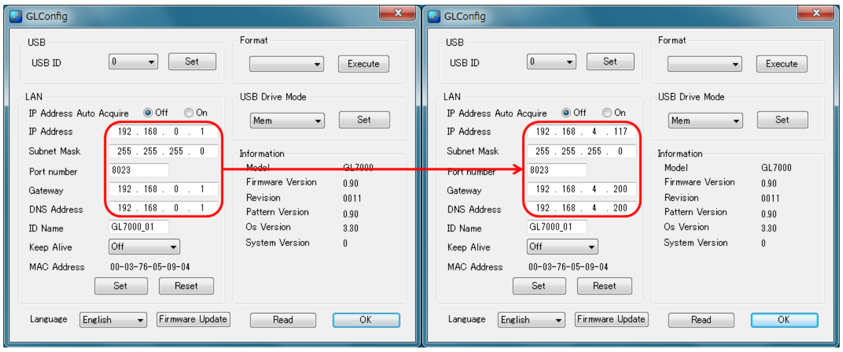

GLConfig
USB
USB ID
Set
Format
Execute
LAN
USB Drive Mode
Set
Set
Reset
Language
English
Firmware Update
Read
OK

IP Address Auto Acquire ○ Off ○ On

Information	
Model	****
Firmware Version	****
Revision	****
Pattern Version	****
Os Version	****
System Version	****

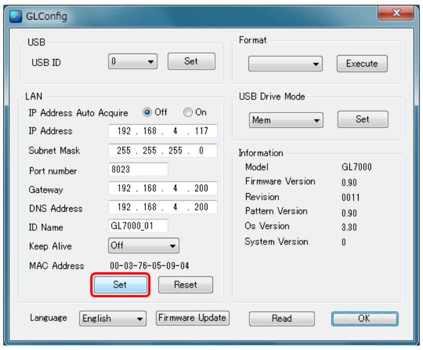
MAC Address **-**-**-**-**-**

Step 4. The current GL7000's LAN-related settings will be displayed, so configure the appropriate settings according to the network environment. Refer to the main module user's manual on the CD for more details on each setting.


GLConfig
USB
Set
Format
Execute
LAN
USB Drive Mode
Set
Set
Reset
Language
Firmware Update
Read
OK
GLConfig
USB
Set
Format
Execute
LAN
USB Drive Mode
Set
Set
Reset
Language
Firmware Update
Read
OK

	Before	After
USB ID	0	0
USB Drive Mode	Mem	Mem
IP Address Auto Acquire	● Off ○ On	● Off ○ On
IP Address	192 . 168 . 0 . 1	192 . 168 . 4 . 117
Subnet Mask	255 . 255 . 255 . 0	255 . 255 . 255 . 0
Port number	8023	8023
Gateway	192 . 168 . 0 . 1	192 . 168 . 4 . 200
DNS Address	192 . 168 . 0 . 1	192 . 168 . 4 . 200
ID Name	GL7000_01	GL7000_01
Keep Alive	Off	Off
MAC Address	00-03-76-05-09-04	00-03-76-05-09-04
Language	English	English
Model	GL7000	GL7000
Firmware Version	0.90	0.90
Revision	0011	0011
Pattern Version	0.90	0.90
Os Version	3.30	3.30
System Version	0	0

Step 5. Select "Set", and apply the settings to the GL7000 main module.


GLConfig
USB
Set
Format
Execute
LAN
USB Drive Mode
Set
Set
Reset
Language
Firmware Update
Read
OK

USB ID 0

USB Drive Mode Mem

IP Address Auto Acquire ● Off ○ On

IP Address 192 . 168 . 4 . 117

Subnet Mask 255 . 255 . 255 . 0

Port number 8023

Gateway 192 . 168 . 4 . 200

DNS Address 192 . 168 . 4 . 200

ID Name GL7000_01

Keep Alive Off

MAC Address 00-03-76-05-09-04

Language English

Information	
Model	GL7000
Firmware Version	0.90
Revision	0011
Pattern Version	0.90
Os Version	3.30
System Version	0

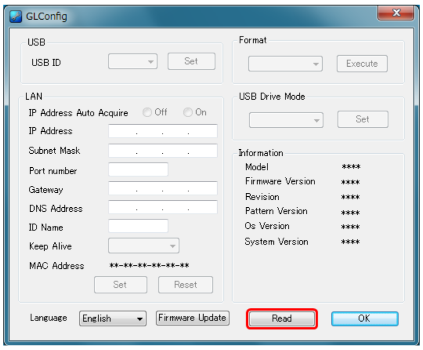
6-5. Device Initialization

Initialize the memory device (built-in flash memory/SD Card/SSD Module) that is connected to the GL7000 main module using GL-Config. Be aware that all of the data on the memory device will be deleted when initialized.

Step 1. Connect one GL7000 main module to the PC using a USB cable, and plug in the GL7000 main module's power source.

Step 2. Launch the software following instructions in “6-1. Launching and Terminating GL-Config”.

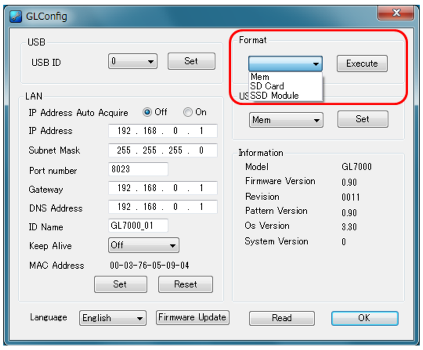
Step 3. Select "Read" to establish communication with the GL7000.


GLConfig
USB
USB ID
Set
Format
Execute
LAN
IP Address Auto Acquire
Off
On
IP Address
Subnet Mask
Port number
Gateway
DNS Address
ID Name
Keep Alive
MAC Address
Set
Reset
USB Drive Mode
Set
Information
Language
English
Firmware Update
Read
OK

MAC Address **-**-**-**-**-**

Model ****
Firmware Version ****
Revision ****
Pattern Version ****
Os Version ****
System Version ****

Step 4. Chose the memory device to be initialized from the initialization menu. (Built-in flash memory/SD Card/SSD Module)

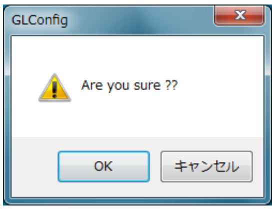

GLConfig
USB
Set
Format
Execute
Mem
SD Card
SSD Module
LAN
Set
Set
Reset
Information
Firmware Update
Read
OK

USB ID 0
IP Address Auto Acquire ● Off ○ On
IP Address 192 . 168 . 0 . 1
Subnet Mask 255 . 255 . 255 . 0
Port number 8023
Gateway 192 . 168 . 0 . 1
DNS Address 192 . 168 . 0 . 1
ID Name GL7000_01
Keep Alive Off
MAC Address 00-03-76-05-09-04
USB Drive Mode Mem

Model GL7000
Firmware Version 0.90
Revision 0011
Pattern Version 0.90
Os Version 3.30
System Version 0

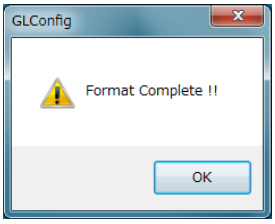
Language English

Step 5. Select "Execute" and then "OK" when the confirmation screen is displayed.


GLConfig
OK
キャンセル

Are you sure ??

Step 6. Select "OK" when the completion screen is displayed.

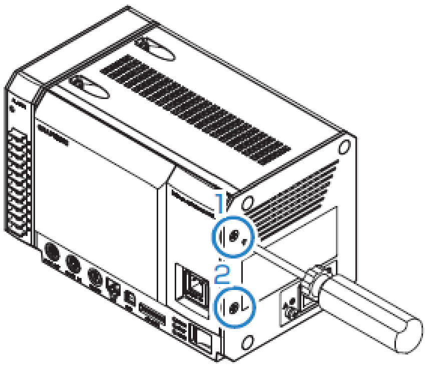

GLConfig
OK

Format Complete !!

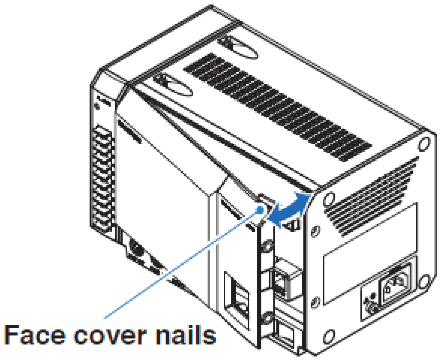
6-6. How to Launch the USB Drive Mode

The USB Drive Mode function recognizes a memory device (built-in flash memory/SD Card/SSD Module) compatible with the GL7000 main module as an external drive from the PC. This allows for simple transfers with the PC that feel the same as PC data of data saved on the memory device connected to the GL7000 main module.

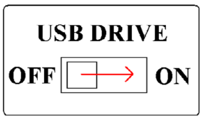
Step 1. Remove the GL7000 main module's fixed screws (in two locations on the side of the module).



Step 2. Pull the upper right tab of the face cover forward, and remove the face cover.

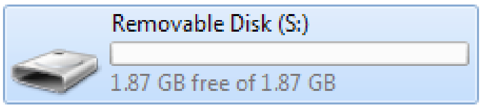


Step 3. Turn the DIP switch for the USB drive that is under the face cover to "ON".



Step 4. Connect one GL7000 main module to the PC using a USB cable, and plug in the GL7000 main module's power source.

Step 5. The GL7000 main module will launch in USB Drive Mode, and will be recognized on the PC as an external drive.(It will launch using the main module's memory in its initial state)



Removable Disk (S:)

1.87 GB free of 1.87 GB

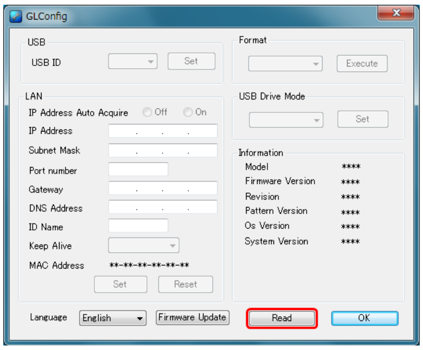
6-7. How to Change the Drive in USB Drive Mode

Select the memory device that will launch in USB Drive Mode from the devices connected to the GL7000 main module using GL-Config.

Step 1. Connect one GL7000 main module to the PC using a USB cable, and plug in the GL7000 main module's power source.

Step 2. Launch the software following instructions in “6-1. Launching and Terminating GL-Config”.

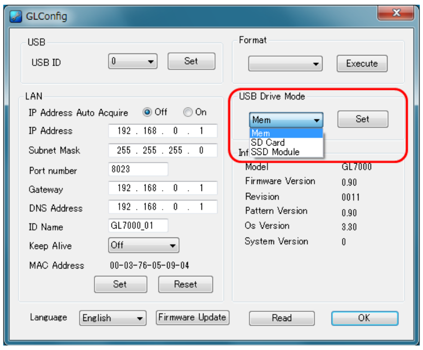
Step 3. Select "Read" to establish communication with the GL7000.


GLConfig
USB
USB ID
Set
Format
Execute
LAN
USB Drive Mode
Set
IP Address Auto Acquire
○ Off
○ On
IP Address
Subnet Mask
Port number
Gateway
DNS Address
ID Name
Keep Alive
MAC Address
Set
Reset
Information
Model
Firmware Version
Revision
Pattern Version
Os Version
System Version
Language
Firmware Update
Read
OK

MAC Address **-**-**-**-**-**

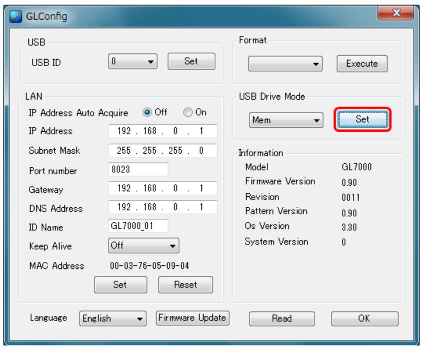
Model ****
Firmware Version ****
Revision ****
Pattern Version ****
Os Version ****
System Version ****
Language English

Step 4. Choose the memory device to launch with from the USB Drive Mode menu. (Built-in flash memory/ SD Card/SSD Module)


GLConfig
USB
Set
Format
Execute
LAN
USB Drive Mode
Mem
SD Card
SSD Module
Set
Inf
Set
Reset
Language
Firmware Update
Read
OK

USB ID 0
IP Address Auto Acquire ● Off ○ On
IP Address 192 . 168 . 0 . 1
Subnet Mask 255 . 255 . 255 . 0
Port number 8023
Gateway 192 . 168 . 0 . 1
DNS Address 192 . 168 . 0 . 1
ID Name GL7000_01
Keep Alive Off
MAC Address 00-03-76-05-09-04
USB Drive Mode Mem
Model GL7000
Firmware Version 0.90
Revision 0011
Pattern Version 0.90
Os Version 3.30
System Version 0
Language English

Step 5. Select "Settings", and apply the settings to the GL7000 main module.


GLConfig
USB
Set
Format
Execute
LAN
USB Drive Mode
Set
Information
Set
Reset
Language
Firmware Update
Read
OK

USB ID 0
IP Address Auto Acquire ● Off ○ On
IP Address 192 . 168 . 0 . 1
Subnet Mask 255 . 255 . 255 . 0
Port number 8023
Gateway 192 . 168 . 0 . 1
DNS Address 192 . 168 . 0 . 1
ID Name GL7000_01
Keep Alive Off
MAC Address 00-03-76-05-09-04
USB Drive Mode Mem
Model GL7000
Firmware Version 0.90
Revision 0011
Pattern Version 0.90
Os Version 3.30
System Version 0
Language English

Step 6. Remove the main module's power source, then remove the USB cable.

Step 7. The settings will be applied the next time the main module launches. Refer to “6-6. How to Launch the USB Drive Mode” for the procedure for launching USB Drive Mode.

6-8. How to Update the Firmware Version

Update the GL7000 main module's firmware version using GL-Config.

6-8-1. Precautions when Performing Version Updates

*Update the version when the main module is at hand. If performed when isolated, such as through a network, it may cause a failure to update the version.

*Absolutely do not remove the power source during the version update. If the power source is removed during the operation, the main module's firmware will be destroyed, and it may be impossible to restore.

*The settings will be initialized when carrying out the version update. Save the setting parameters beforehand. Refer to “11-11-2-2. Main module Data” in the GL-Connection manual for how to save the settings.

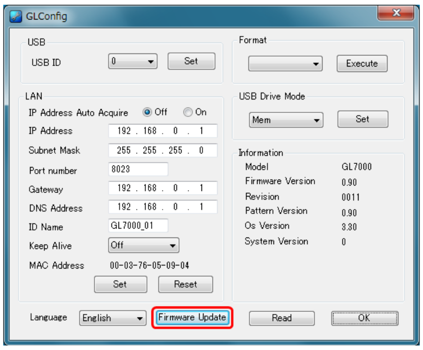
*The settings in the I/F menu (such as USB-ID, etc.) may change due to the version update. The I/F menu settings cannot be saved to a file. Make a note of the settings beforehand and reconfigure them after the version update.

6-8-2. Version Update Procedure

Step 1. Download the latest GL7000 firmware from this company's website (http://www.graphtec.co.jp/).
(*Please answer our simple questionnaire.)
Step 2. Connect one GL7000 main module to the PC using a USB cable or a LAN cable, and plug in the GL7000 main module's power source.
Step 3. Launch the software following instructions in “6-1. Launching and Terminating GL-Config”.
Step 4. Select "Read" to establish communication with the GL7000.
Step 5. The "MainVerxxxRevyyyyAzz.GL7000" file will be created after extracting the downloaded "GL7000Vxxx.exe" by double clicking.

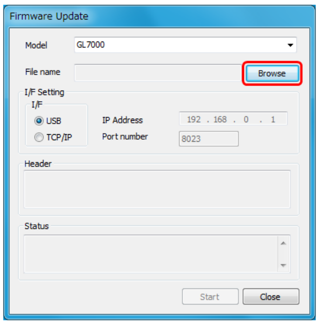
Name	Explanation
xxx: Version Information	100 → V1.00
yyyy: Revision Information	0001 → Rev0001
zz: Special Item Number	00 → Reference Standard

Step 6. Select "Firmware Update" and the firmware update screen will be displayed.



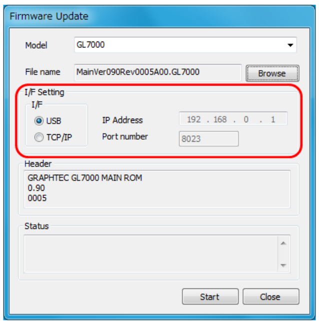
USB ID: 0
IP Address Auto Acquire: ● Off ○ On
IP Address: 192 . 168 . 0 . 1
Subnet Mask: 255 . 255 . 255 . 0
Port number: 8023
Gateway: 192 . 168 . 0 . 1
DNS Address: 192 . 168 . 0 . 1
ID Name: GL7000_01
Keep Alive: Off
MAC Address: 00-03-76-05-09-04
USB Drive Mode: Mem
Model: GL7000
Firmware Version: 0.90
Revision: 0011
Pattern Version: 0.90
Os Version: 3.30
System Version: 0
Language: English

Step 7. Select "Browse" and select the extracted file from step 5.



Model: GL7000
File name:
I/F: ● USB ○ TCP/IP
IP Address: 192 . 168 . 0 . 1
Port number: 8023

Step 8. Configure the I/F settings according to the type of cable connected.



Model: GL7000

File name: MainVer090Rev0005A00.GL7000

I/F Setting

I/F: ● USB ○ TCP/IP

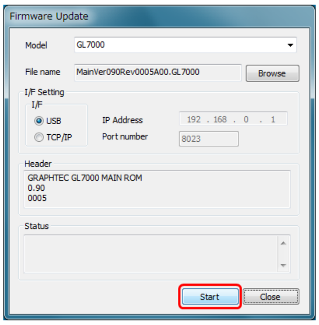
IP Address: 192 . 168 . 0 . 1

Port number: 8023

Header: GRAPHTEC GL7000 MAIN ROM
0.90
0005

Status:

Step 9. Select "Start" to start the update. When the confirmation screen is displayed after the update is finished, select "OK".



Model: GL7000

File name: MainVer090Rev0005A00.GL7000

I/F Setting

I/F: ● USB ○ TCP/IP

IP Address: 192 . 168 . 0 . 1

Port number: 8023

Header: GRAPHTEC GL7000 MAIN ROM
0.90
0005

Status:

Step 10. A buzzer will ring when the update is completed if the GL7000 Display Module is equipped. When the update is complete, the SD Card LED will go from from flashing to solid, even if the Display Module is not equipped.

7. GL-Connection Basic Operation

The basic operation of the GL-Connection software consists of the following 4 configurations.

Description	Explanation
1. Managing the GL device (main module)	Manages the operations and settings for the main module, and loads the main module's setting information on to this software through the connection between the GL device and the PC.
2. Confirmation of the input data	Confirms the input signals to the main module in real-time using this software's graphical displays through the connection between the GL device and the PC.
3. Data Recording	Saves transmitted data to the PC through the connection between the GL device and the PC. And either the PC or the GL device can be used as a backup due to the ability to save recorded data on the main module.
4. Recorded data playback	Plays back recorded data files on the PC. Also plays back saved data on the main module through the connection between the GL device and the PC. Played back data may be split into important segments and converted to, then saved in other formats.

7-1. Managing the Main Module

This software allows the following management functions.
*Start/stop recording
*Amplifier settings (input, range, filter, etc.)
*Recording settings (sampling interval, main module recording destination, external sampling setting, etc.)
*Trigger and alarm settings (trigger level settings, alarm level settings, etc.)
*Other settings (temperature unit changes, factory settings, etc.)

7-2. PC and Main Module Recording

This software allows management of PC and main module recording. PC recording saves data received from the GL device on a file on the PC. Main module recording saves recordings performed on the main module on a recording medium.
PC recording and main module recording can be performed simultaneously.

*Recording to the PC cannot be performed if the main module's recording destination is built-in RAM or the SSD Module (optional).

7-2-1. PC Recording

The recording capacity depends on the OS limits, but recordings can be over 2TB (terabytes) when using the general Windows XP/Vista/7 NTFS file system. PC recording can also be continuously performed even if the disk becomes full on the main module recording. PC recording creates separate Min/Max compression data with the recorded data. This data reduces the number of data reads during playback to improve operability. For information, refer to “11-11-2-4. Create Compressed Data”.

7-2-2. Main Module Recording

Saves data to the main module's recording medium. The recording destination can be built-in RAM, built-in flash memory (standardly equipped with 2GB), external SD Card, or expanded 64GB SSD Module (optional).

*Built-in RAM: Records from a maximum of 1 microsecond due to the equipped amplifier. PC recording cannot be performed simultaneously.
*Built-in flash memory and SD Cards: Records from a maximum of 1 millisecond.
*SSD Module: Records from a maximum of 1 microsecond due to the equipped amplifier. PC recording cannot be performed simultaneously.

(*Refer to “12-3-1. Sampling limits” for the sampling intervals that can be set.)

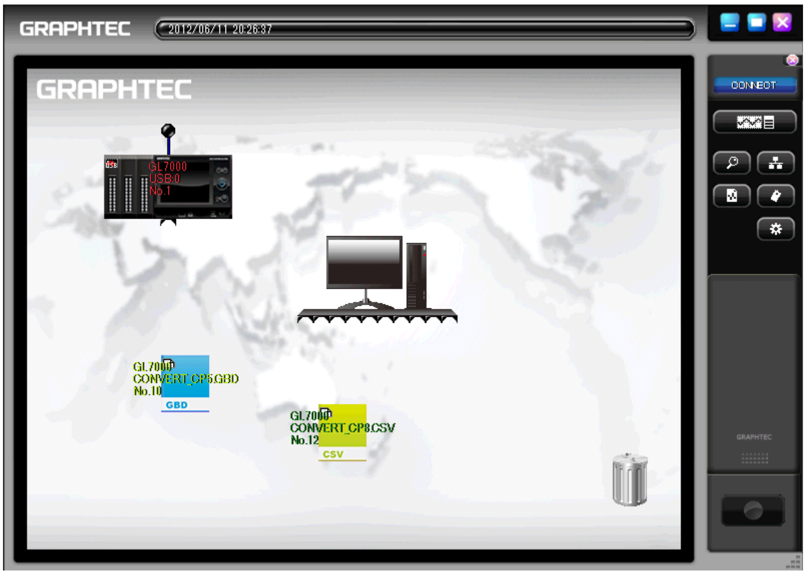
7-3. Recorded Data Playback

Data recorded as GBD (binary) data or CSV (text) data can be played back with this software. It is possible to confirm the played back data's signal level, and to display statistical values such as maximum value or minimum value, etc., for a specified range. There is also a conversion saving function, which splits and saves only important data segments, and a file connection function, which combines multiple connected data segments.

8. Launching and Terminating GL-Connection Software

8-1. Launching the Software

Launch the software by choosing "Start" on the OS taskbar → "Programs (All Programs)" → "Graphtec" → "GL-Connection" → "GL-Connection". The following screen will display when it's finished launching. (The following image is confirming two GL7000 modules.)


GRAPHTEC
2012/06/11 20:26:37
GRAPHTEC
CONNECT
GL7000
USB:0
No.1
GL7000
CONVERT_CP5.GBD
No.10
GBD
GL7000
CONVERT_CP8.CSV
No.12
CSV

---

* When the software does not launch

Try the following when the software does not launch.

<When it cannot launch initially>

Confirm whether the PC being used meets the operating requirements.

The installation may not have been performed correctly. Delete the program from the control panel and reinstall it.

<When it cannot launch after the initial launch>

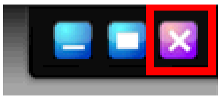
There may be competing settings files. Delete the following files and launch the software.

My Documents → Graphtec → GL-Connection → Delete everything in the Ini folder

---

8-2. Terminating the Software

Click the "X" on the upper right corner of the main screen to terminate the software.

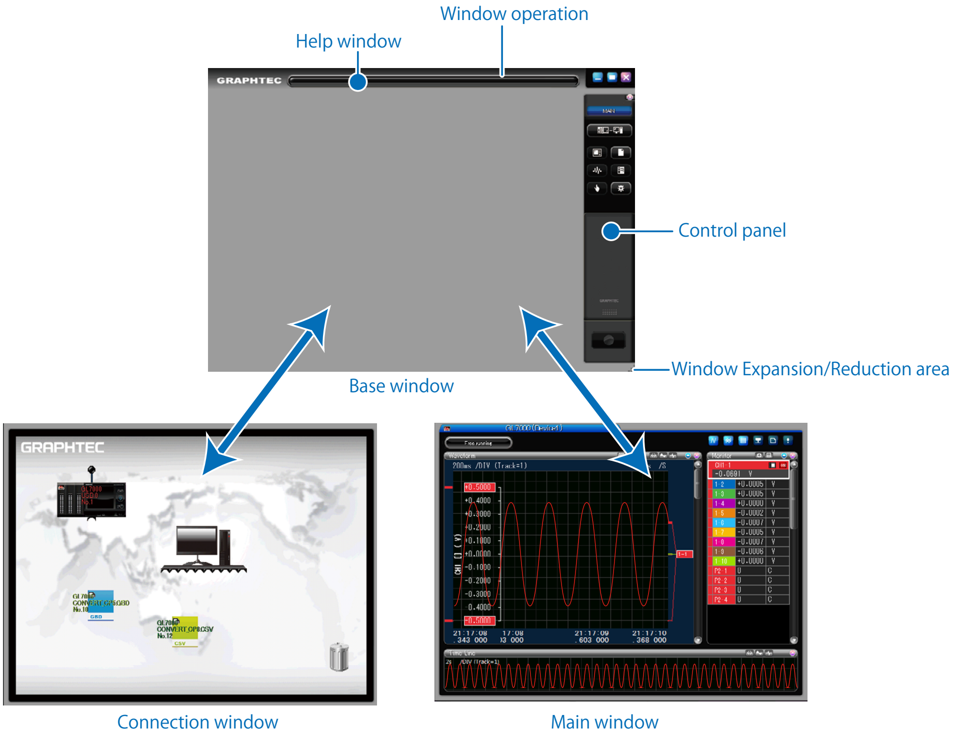


A settings file is created when the software is terminated, but when the software is terminated using any method other than the previous one (i.e. forced termination, etc.), the settings file is not created.

9. Application Screen

9-1. Configuring the Application Screen

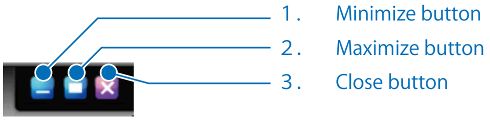
The following screen is this application's screen configuration.
*Base Window
*Connection Window
*Main Window


Window operation
Help window
GRAPHTEC
Control panel
Window Expansion/Reduction area
Base window
GRAPHTEC
Connection window
Main window

9-2. Base Window

This is the window that acts as a base that includes the connection window and the main window.

9−2−1. Window Operations


1. Minimize button
2. Maximize button
3. Close button

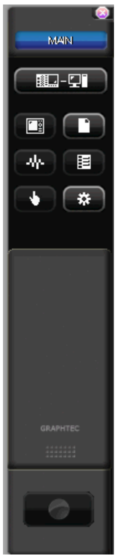
Minimize - Minimizes the application window.
Maximize - Maximizes the application window, and returns to the original size.
Close - Closes and terminates the application window.

9−2−2. Help Window

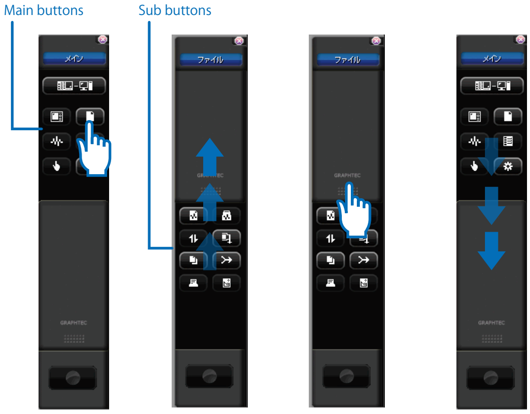
2012/04/03 16:23:38

Displays help information for mouse buttons and so forth. The help window allows for efficient browsing of the help file whether scrolling through the numerous character data up, down, left or right.

9-2-3. Control Panel



The window that controls both the connection window and the main window. Buttons on the control panel change in relation to the presence of the connection and main windows. Help balloons will appear when the buttons on the control panel are moused over.



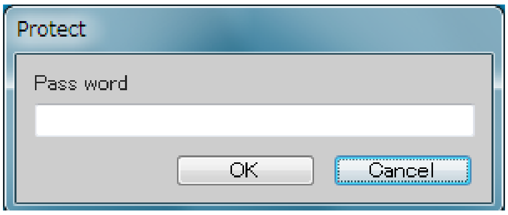
The control panel configures two groups of main buttons and sub buttons. Click the upper main button to change it to the lower sub button like sliding a remote control cover. Click the slide bar to once again change to the main button display.

9-2-3-1. Control Panel and Window Operations Lock

It is possible to lock operations by closing the control panel. Press the lock from the control panel's option button, input a password and press the OK button to create a password lock. Repeat these operations and re-input the password to remove the lock.

Lock Status

Password Input Screen

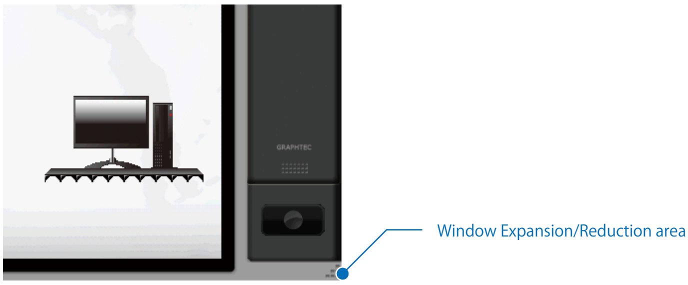


Protect

Pass word

Be sure not to forget the password when using a lock with a password.
The lock status doesn't support the forced termination of this application.
The software will launch unlocked the next time it is launched.

9-2-4. Window Expansion/Reduction Area



Change the screen size by dragging the bottom right (window expansion/reduction area) of the base window.
The minimum screen size is 800 x 600 dot. One screen section display is recommended at minimum size.
When multi-windows are at their minimum size, they may display overlapped, and may not be forcefully displayed in the internal window. In that case, increase the screen size, or section it into one screen.

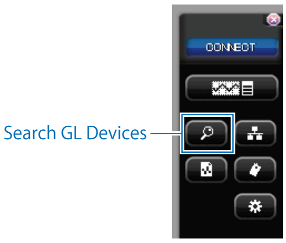
10. Connection Screen

Configure the settings for connecting the PC and the GL device.

10-1. Automatic Device Recognition

GL-Connection automatically searches for GL devices that are connected when the "Search" button is pressed and launching. The devices found through the automatic search will be displayed as a device icon on the screen. Click the displayed device icon to initiate the connection. Up to 20 icons including files and GL devices (up to 10 GL device icons) can be recognized.

(*When the limit of device and file icons has been reached, new icons won't be displayed, and connection or playback cannot be performed. In that case, delete icons to reduce their number.)


Search GL Devices
CONNECT

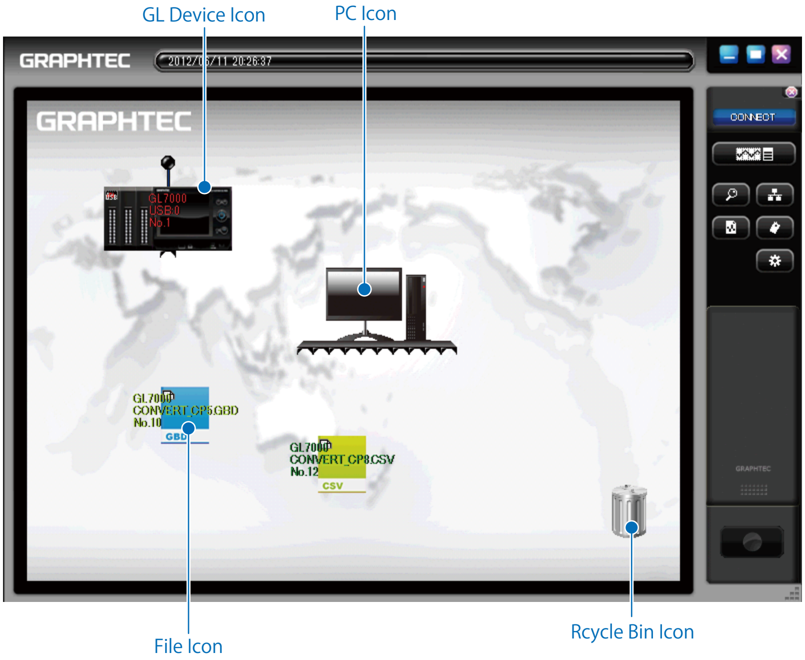
---

* Automatic recognition through LAN will only occur within the same network segment.

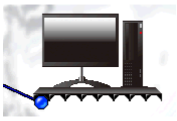
---

* Confirm the following and perform these operations when a device is not recognized.
Confirm whether the GL device's interface cable is connected correctly.
Confirm whether the GL device's power source is plugged in (or plug it in again).
Confirm that the GL device's USB ID or IP address is not duplicated.
Change to another number or address if it is duplicated.
Confirm whether the devices can be automatically recognized using the LAN.
Relaunch the application.
Relaunch the PC.

10-2. Connection Screen Explanation

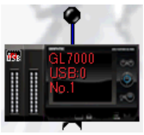

GL Device Icon
PC Icon
GRAPHTEC
2012/05/11 20:26:37
GRAPHTEC
GL7000
USB:0
No.1
CONNECT
GL7000
CONVERT_CP6.GBD
No.10
GBD
GL7000
CONVERT_CP8.CSV
No.12
CSV
File Icon
Rcycle Bin Icon

10-2-1. PC Icon



Displays the PC being used. Move to a preferred location by dragging it with the mouse. Also, perform the same device search by clicking a PC icon.

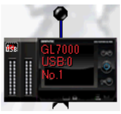
10-2-2. GL Device Icon


GL7000
USB:0
No.1

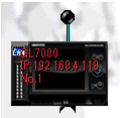
This is an icon for a recognized GL device. It is displayed when a GL device is recognized using a USB or LAN connection. Click the icon to initiate the connection.

10-2-2-1. Types of GL Device Icons

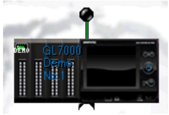
The following types of GL device icons will occur depending on the connection method.


GL7000
USB:0
No.1

USB Connection (States the USB number)

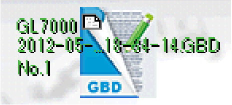

GL7000
IP:192.168.4.116
No.1

LAN Connection (States the IP address)

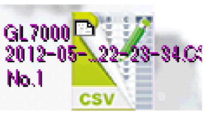

GL7000
Demo

Demo Connection (States Demo mode)

10-2-3. File Icon


GL7000
2012-05-...18-34-14.GBD
No.1
GBD

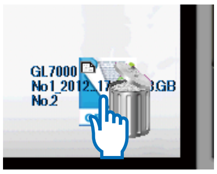
GBD File Icon


GL7000
2012-05-...22-23-34.CS
No.1
CSV

CSV File Icon

This is the icon displayed by performing file playback. Use it as a log of files that have been opened previously.
(*The icon won't be displayed when main module data playback is performed on the GL device main module)

10-2-4. Recycle Bin Icon


GL7000
No1_2012...17...GB
No.2

Disconnect a GL device or delete a file by dropping its icon on the recycle bin using the mouse.

GL Device Icons: Disconnects a GL device or deletes its icon from the screen. The icon will be redisplayed when a search is performed again.

While disconnected: Deletes the icon
While connected: Disconnects the device then deletes the icon

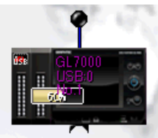
File Icon: Deletes the icon from the screen and erases the previously opened log. The file itself will not be deleted.

10-3. Connection and Disconnection

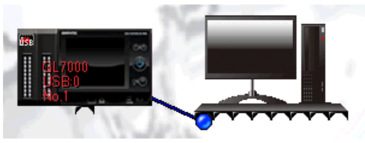
10–3–1. Connection

Initiate a connection by clicking a displayed device icon (Clicking a file icon performs file playback). A bar will be displayed above the icon while it acquires the GL device information. Cancel the connection by clicking the icon again while it's connecting. Also, it will automatically configure the GL device's time to the PC's time when connecting.

Connecting


GL7000
USB:0
60%

Connection Complete


GL7000
USB:0
No.1

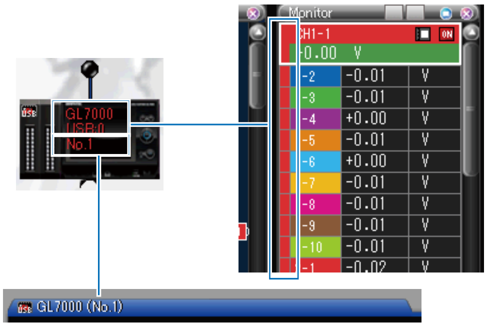
＊ CHECKPOINT

*Connections cannot be made when the GL device is in playback. Confirm the GL device's operational status.

*This software can only stop recording for the GL device when connecting while the GL device is recording. Normal operations are possible after recording is stopped.

10–3–2. Device Colors and Device Numbers

Device colors and device numbers will be assigned automatically in the order the devices are recognized. It is possible to confirm the device by using these device colors and numbers when mixing groups of multiple devices.


GL7000
USB:0
No.1
Monitor
CH1-1
ON
+0.00 V
-2 -0.01 V
-3 -0.01 V
-4 +0.00 V
-5 -0.01 V
-6 +0.00 V
-7 -0.01 V
-8 -0.01 V
-9 -0.01 V
-10 -0.01 V
-1 -0.02 V
GL7000 (No.1)

10-3-3. Linked Connections (Synchronous and Simultaneous Connections)

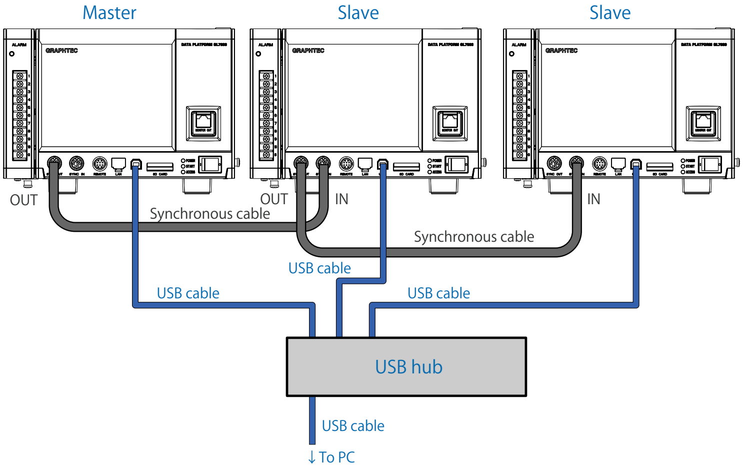
Manages the simutaneous stopping and starting of recording for multiple GL devices. Linked Connections have two methods, synchronous connections and simultaneous connections.
Device settings are required for both synchronous and simultaneous connections. Configure the synchronous settings the same as in "12-3. Data settings" for the data settings and as in "12-4. Trigger settings"for the trigger settings. (Recording may still be able to be performed even if the settings are not identical, but the data may not be synchronized correctly)
*Files recorded to the PC will be created separately for both synchronous and simultaneous connections.

10-3-3-1. Synchronous Connections

Synchronous connections can connect up to 5 GL7000 modules using optional sync cables. Recordings without errors are possible using multiple GL7000s by synchronizing the recording start timing with the hardware.
The following things are made in synchronous connections
*A start/stop is synchronized by each main module.
*When Trigger is used, Trigger is synchronized by each main module. (Synchronized Recording start)
*Since a clock is synchronized by each main module, even if it records for a long period of time, the time error of each main module is settled in a fixed interval.

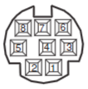
10-3-3-2. How to Wire Synchronous Connections (Using USB Connections)

Connect the USB cables and sync cables according to the following diagram for synchronous connections.
The device that only has the sync cable connected to the OUT terminal will be the master for planning synchronous timing. (*The sync cable is optional)

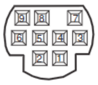


*Also in LAN, it becomes the same.
*Mixture of LAN and USB cannot be performed.

Cross-section of the Sync Cable Terminal



OUT Connector

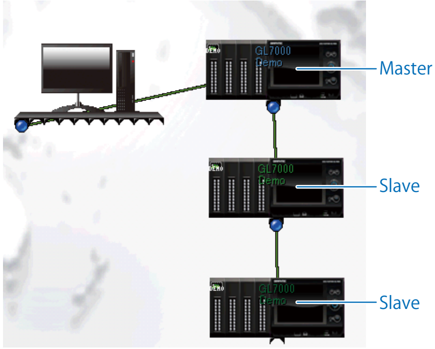


IN Connector

(*Do not connect the same cable into the IN and OUT terminal in one GL7000 module)

10-3-3-3. How to Configure Synchronous Connection Settings

Configure the connection settings according to the following diagram using this software. Synchronous connection cannot be performed automatically, so perform the same connections as those using sync cables.



1. Connect the master GL device to the PC.
2. Drag the slave GL device icon's plug to the master device icon.
3. Continue by dragging another slave GL device's plug to the previous slave device.

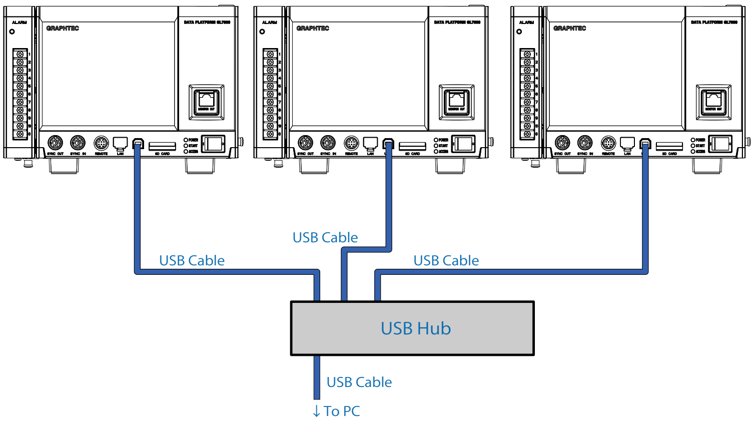
*Recordings may not be processed correctly if the connections are not performed in the same way as sync cables, so perform the connections in the same order as the sync cables.
*Waveform display and Recording file creation to PC are performed for every main module during synchronous connection.

10-3-3-4. Simultaneous Connections

Simultaneous connections is attained when the main module which does not correspond to synchronous connection also makes link connection. Simultaneous connections is by hardware.
Although a synchronization is not performed, operation in which it is mentioned in order and which is carrying out synchronous connections of the start control is possible.
*The simultaneous timing in simultaneous connection is not guaranteed.

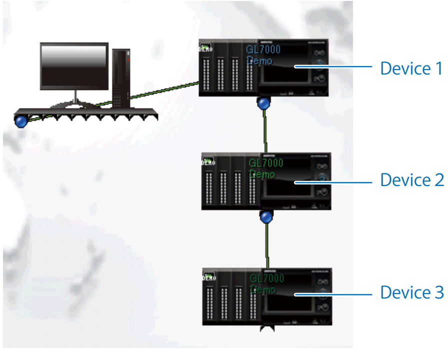
10-3-3-5. How to Wire Simultaneous Connections (Using USB Connections)

Connect the USB cables and sync cables according to the following diagram for simultaneous connections.



*Also in LAN, it becomes the same.
*Mixture of LAN and USB cannot be performed.

10-3-3-6. How to Configure Simultaneous Connection Settings



1. Connect the GL device 1 to the PC.
2. Drag the GL device 2 icon's plug to the GL device 1 icon.
3. Continue by dragging another GL device 3 icon's plug to the previous GL device 2.

*Waveform display and Recording file creation to PC are performed for every main module during synchronous connection.

10-3-4. Preserving Device Condition

Played back data files and devices that have been connected at least once will be saved to an internal list, and previous icons will be preserved as when the software is launched the next time. The contents of preserved statuses are as follows.
Saved files are stored in the following location.
My Documents → Graphtec → GL-Connection → Ini → IniFile.cnd

Saved Contents

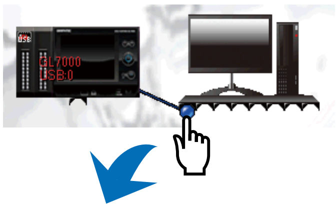
- Display locations for PC icons and device icons
- Wallpaper
- Language settings
- Mail settings
- Print settings
- CSV configuration
- File playback log
- Time/DIV
- Y-axis display width for each channel

*GL device information (such as amplifier settings, recording settings, etc.) will not be saved to the PC. Settings will be read from the GL device when it is connected.

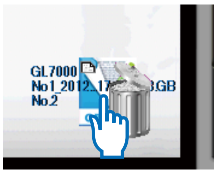
10-3-5. Disconnection and Deletion

Disconnection and deletion have different operations for device icons and file icons.

Remove a plug connected to the PC to disconnect the transmission. And drop the device icon into the recycle bin to disconnect the transmission and delete the icon. (The device icon will reappear when the device search is performed again)

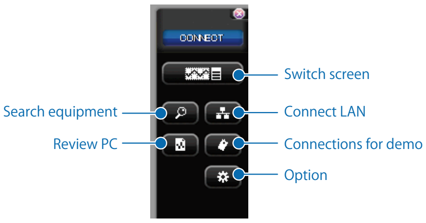


Drop a file icon into the recycle bin to delete the playback log, and the file icon will no longer be displayed automatically the next time the software is launched. (*The file itself will not be deleted from the PC)



10-4. Control Panel for the Connection Screen

This explains the control panel on the connection screen.



10–4–1. Switch Screen

Changes the displayed screen.

10–4–2. Search GL Devices

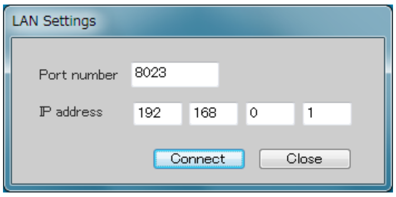
Searches for connected devices and displays the icons for the detected devices on the screen. Devices that can be detected using a search are either connected to the PC using USB, or are devices such as the GL7000 that support automatic LAN recognition when connected using LAN.

10–4–3. LAN connection

Devices that do not support automatic LAN recognition can be connected using LAN with manual settings. Connect to a GL device by inputting the IP address or port number set in “5-3. Setting the USB ID or the IP address”.

10-4-3-1. Connection Screen

Set the IP address and port number set on the GL device main module, and press the connect button.



Port number 8023

IP address 192 168 0 1

10–4–4. Connections for Demo

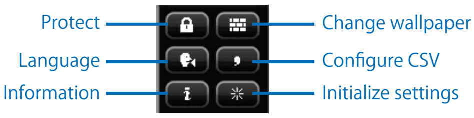
Repeatedly displays recorded files and displays them as demo waveforms. Default demo waveforms will be installed during this software's installation (Go to My Documents → Graphtec → GL-Connection → Data → Demo.gbd on the PC).

The following operations can be performed using demo connections.

- Waveform display/Waveform operation
- Display the digital monitor
- Browse the settings
- Group Creation

10-4-5. Option Settings

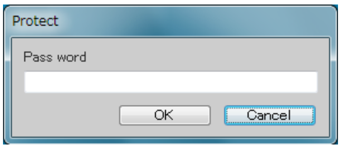
Used for changing the password to lock operations, display language, etc.



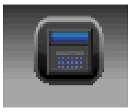
10-4-5-1. Protect Setting

You can set the password used to lock your device. Pressing the OK button will end the application, lock the operation and you will be unable to bring up the control panel, use window controls, or end the application.

Password Input Screen



Device Lock Icon



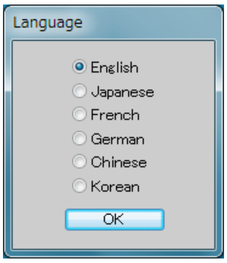
To release the lock on the device, press the device lock icon, end enter the password. The control panel and window operations will be displayed again, and you may resme operations. In the event of a forced termination of the software, the locked condition will not be preserved. The next time it is started up, it will be unlocked.

10-4-5-2. Change Wallpaper

You may load a custom BMP file and set it to be your wallpaper. If you set your wallpaper to a picture of measurement environment, aligning your PC location and GL device location will lead to a closer measurement environment image.

10-4-5-3. Language Setting

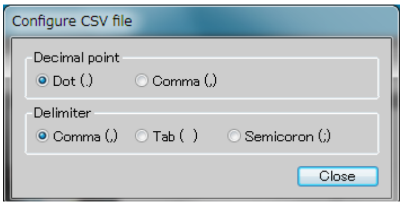
You can change the display language.



● English
○ Japanese
○ French
○ German
○ Chinese
○ Korean

10-4-5-4. CSV Configuration Settings

Sends you to CSV Data Delimiter and separator options. Please set to the same language as the PC you are currently using. CSV Config settings for Recording and Output must be the same as CSV data for playback, or else it will not properly play back.



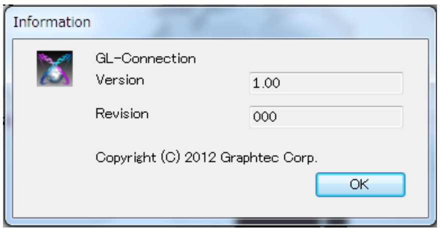
Decimal point: ● Dot (.) ○ Comma (,)

Delimiter: ● Comma (,) ○ Tab ( ) ○ Semicoron (;)

Decimal Point Characters: You can change the character used for decimal points.Please use the (.)
Punctuation Characters: You can change the character used to separate two items.Please use the(,)comma as the default.

10-4-5-5. Information

Displays the software's current version and revisions.


Information

GL-Connection

Version 1.00

Revision 000

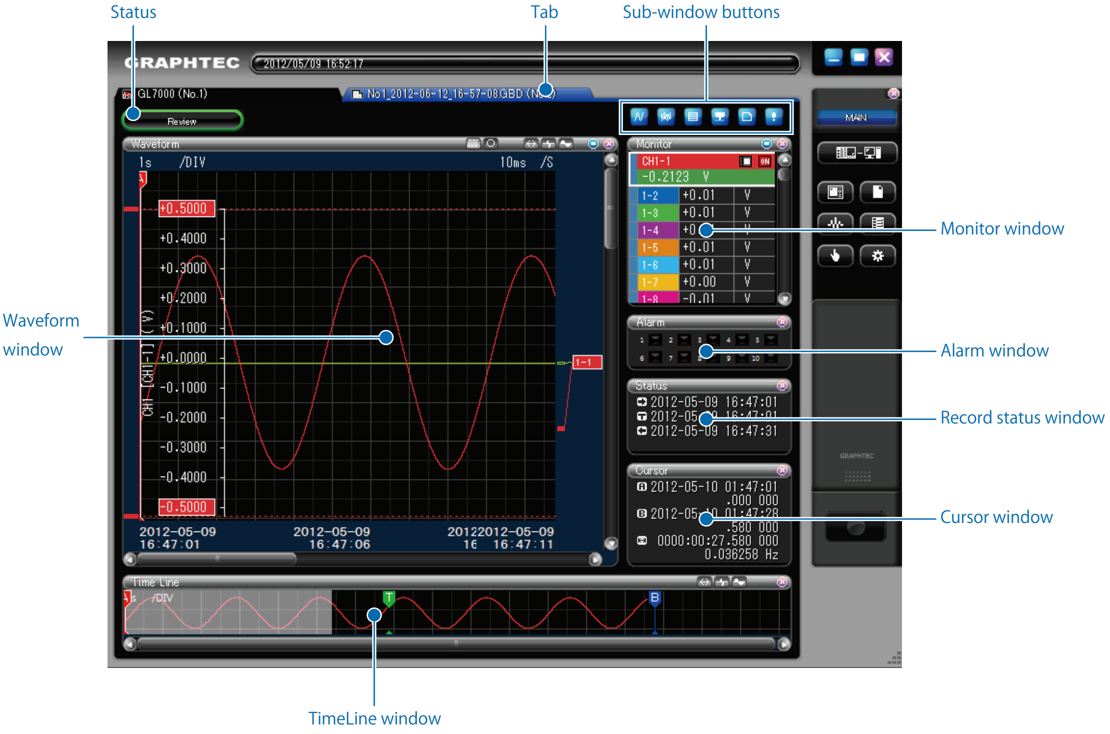
Copyright (C) 2012 Graphtec Corp.

10-4-5-6. Installation Initialization

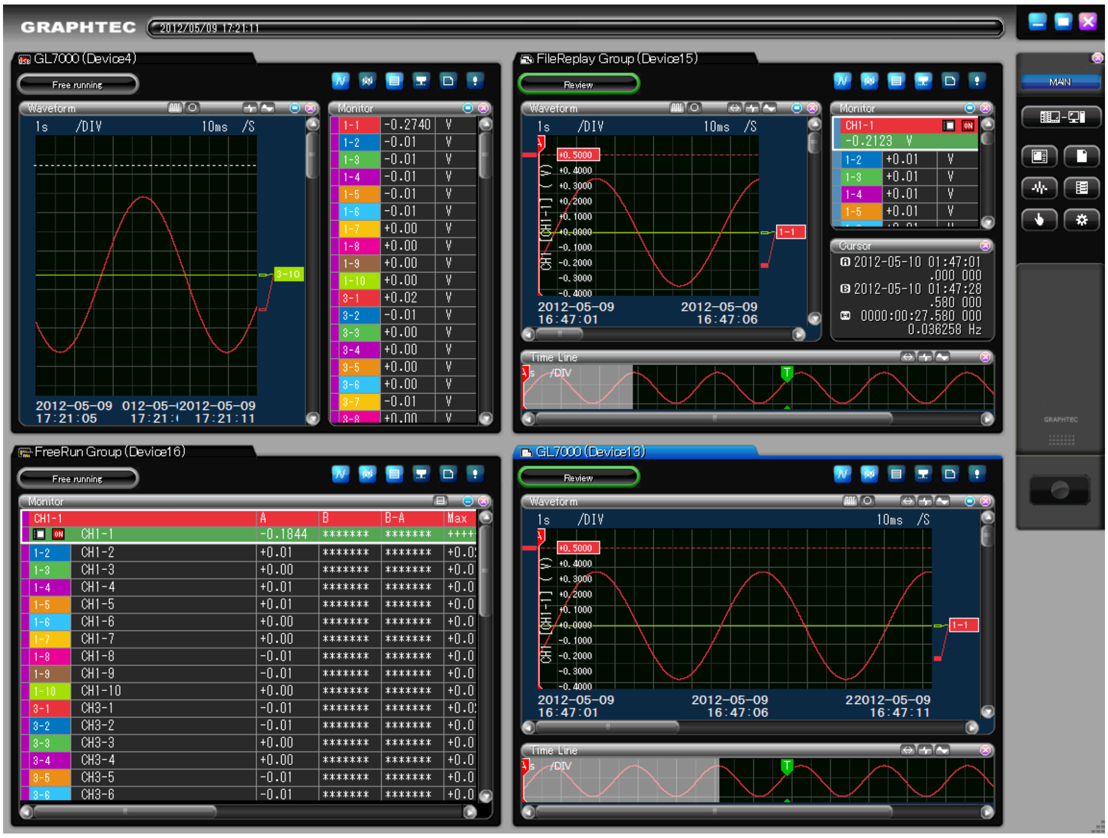
You can set initialize the setting for the software. After implemented, the initialization will happen after the next start up. Please see the contents of initialization in “10-3-4. Preserving Device Condition”.
During initialization, the language will be reset to the default, so please set the language again after rebooting.
System settings will not be initialized.

11. Main Screen

You can access the Waveform Display and Digital Display from the main screen. The main screen can separate into up to 4 window displays. On start up 1window will be displayed.


Status
Tab
Sub-window buttons
Monitor window
Waveform window
Alarm window
Record status window
Cursor window
TimeLine window
GRAPHTEC
GL7000 (No.1)
Review
Waveform
Monitor
Alarm
Status
Cursor
Time Line
MAIN

4 Section Display Example

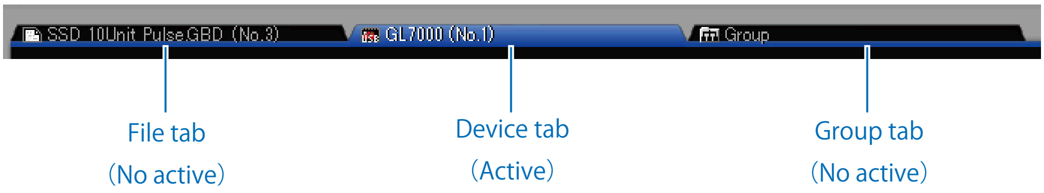

GRAPHTEC
GL7000 (Device4)
Free running
FileReplay Group (Device15)
Review
FreeRun Group (Device16)
GL7000 (Device13)
Waveform
Monitor
Cursor
Time Line
MAIN

11-1. Tabs

Connected GL devices and files will displayed on their own tabs in the Connection Screen. Tabs can be active or inactive, clicking a tab will make it active. You can manipulate active tabs using the Control Panel. If a tab is dragged with the mouse, the navigation window is displayed, and it is possible to use multi-window features, group creation, or deletion. For information on tab features, please see "11-10-1. Navigation Window". In 1 window, a maximum of 20 tabs can be created.

11−1−1. Tab Elements and Status

There are device tabs, filter tabs, and group tabs. Currently selected tabs will be displayed in blue as active tabs and inactive tabs will be displayed in black. In the device and file tabs, the device number is displayed. This number is like the device color and used to differentiate tabs.



11−1−2. Tab Icon Types

Elements	Name	Explanation
Device Tab	USB Connection Icon	Devices connected by USB are shown.
	LAN Connection Icon	Devices connected by LAN are shown.
	Demo Connection Icon	Devices connected by DEMO are shown.
File Tab	File Icon	Shows tabs with file playback.
	Device Playback Icon	Shows tabs with file playback.
Group Tab	Open Group Icon	Shows the Open Group tab. For information on group functions, refer to "13-1. Group functions".
	Free Running Group Icon	Displays the Free Running Group tab. For information on group functions, refer to "13-1. Group functions".
	File Group Icon	Displays the File Group tab. For information on group functions, refer to "13-1. Group functions".

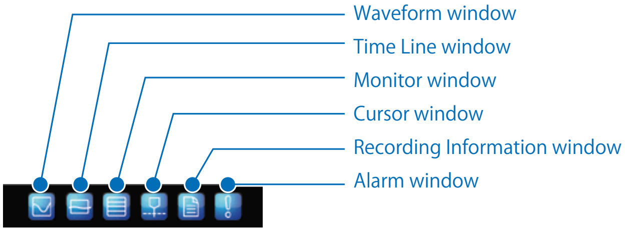
11-2. Status

Displays the operational status of the Screen.

Screen	Name	Explanation
Free running	Free-Running Status	When connected to GL functions, this displays waveform.
Armed	Armed Status	In recording state, waiting for trigger detection.
Recording...	Recording In Progress Status	During recording, the trigger is being detected and will record.
Review	Review Status	Files of the PC are currently in playback, or the data of the GL device is in playback.

11-3. Sub-Window Button

From the main window, 6 windows can be opened or closed. There are also windows that cannot be displayed depending on their current operational status. If the display screen is narrow, there are times where the window will close automatically. Please change it every time to display the windows you find necessary.


Waveform window
Time Line window
Monitor window
Cursor window
Recording Information window
Alarm window

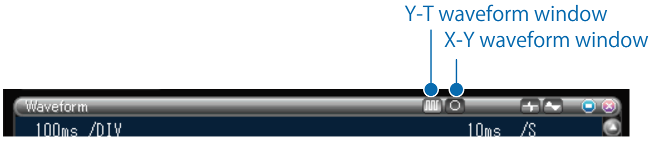
Name	Explanation
Waveform Window	Open or close Waveform Window.
Time Line Window	Open or close Time Line Window.
Monitor Window	Open or close Monitor Window.
Cursor Window	Open or close Cursor Window. Only available during playback.
Recording Information Window	Open or close Recording Information Window. The content will change depending on the current operational status.
Alarm Window	Open or close Alarm Window.

11-4. Waveform Window

Opens the Waveform Display window. You can switch between Y-T,X-Y, and other display options for the Waveform Display Screen. When changing to waveform mode the waveform display information will be cleared, but recording data for recordings in progress will not be erased.

11–4–1. Waveform Mode Change Button

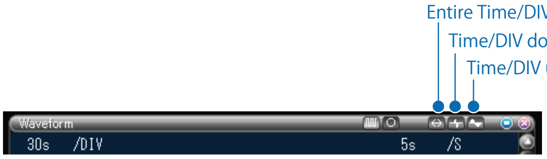
Change waveform mode.


Y-T waveform window
X-Y waveform window
Waveform
100ms /DIV
10ms /S

Name	Explanation
Y-T Waveform Window	Change screen to Y-T wave form. If the waveform display screen is already set to Y-T display, pressing the Y-T Waveform Window button will change the arrangement of the waveform. For information on waveform arrangement, please see “11-11-3. Waveform Operations”.
X-Y Waveform Window	Change screen to X-Y waveform. If the waveform display screen is already set to X-Y display, pressing the X-Y Wave form Window button will operate to clear the X-Y waveform. Refer to “11-11-5. Action”. The X-Y waveform window cannot be changed during playback.

11–4–2. Time/DIV Button

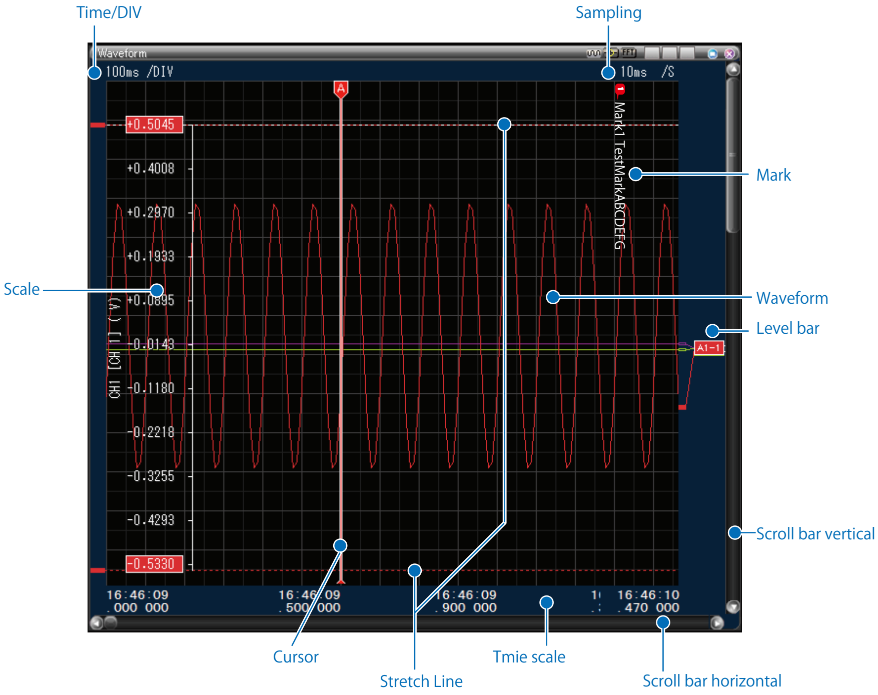
Changes waveform's Time/DIV during Y-T waveform display.


Entire Time/DIV
Time/DIV down
Time/DIV up
Waveform
30s /DIV
5s /S

Name	Explanation
Display everyhing on Time/DIV	Calculate and change to the optimal Time/DIV to display the complete length of the waveform. Only available during playback.
Time/DIV Reduction	Reduce the Time/DIV setpoint, and display the reduced waveform.
Time/DIV Expansion	Raise the Time/DIV set point, and display the expanded waveform.

11-4-3. Y-T Waveform Display

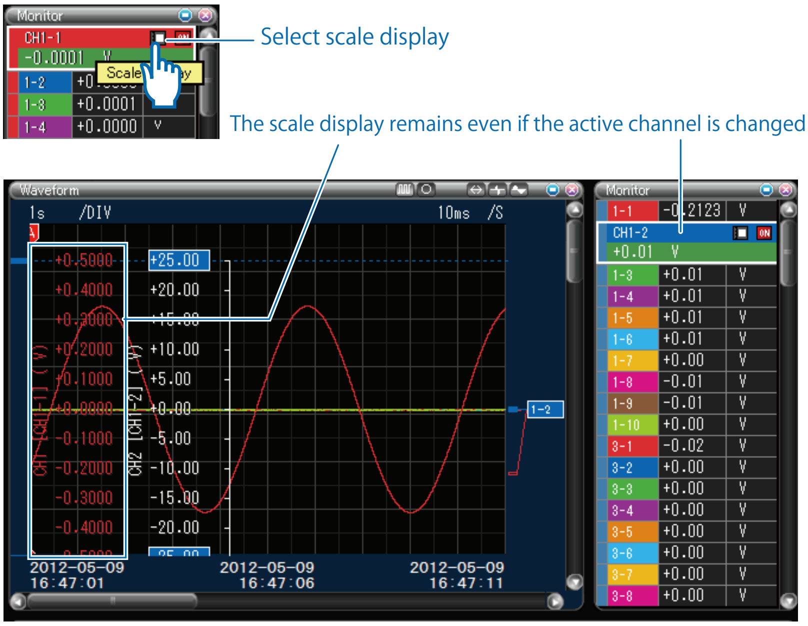
The input signal level is displayed on the Y axis, and time is displayed on the X axis of this graph.


Time/DIV
Sampling
Waveform
100ms /DIV
10ms /S
A
+0.5045
+0.4008
+0.2970
+0.1933
+0.0895
-0.0143
-0.1180
-0.2218
-0.3255
-0.4293
-0.5330
Mark1 TestMarkABCDEFG
A1-1
16:46:09 .000 000
16:46:09 .500 000
16:46:09 .900 000
16:46:10 .470 000
Mark
Scale
Waveform
Level bar
Scroll bar vertical
Cursor
Stretch Line
Tmie scale
Scroll bar horizontal

Name	Explanation
Time/DIV Display	Display the Time/DIV value of the currently displayed waveform. Time/DIV displays time to one 1 grid axis. For 1sec/DIV1 grid's display axis is 1 second.
Sampling Display	Displays the value of sampling from a connected device, or the sampling of a file that is being played back.
Waveform Display	Displays the waveform.
Scale Display	Displays the scale of the channel set to active in the monitor window. If you break the button the leave the scale in the monitor window, you can view several scales at once.
Stretch Line Display	The stretch line displays the channel set to active in the monitor window. The stretch line's upper value is found in the Span Setting's upper value, while the stretch line's lower value is found in the Span Setting's lower value.
Level Bar Display	Displays each channel's signal position. If the level bar is dragged with the mouse, the upper and lower values of the waveform can be changed.
Time Scale Display	The X axis displays time. The displayed information is changed to match the Time/DIV setting.
Cursor Display	While data is being played back the cursor is displayed, and above the cursor you can see the time frame, signal level, etc. There is an A cursor, and B cursor, and they can be moved left or right by dragging with the mouse.
Mark Display	During Recording you can record a mark in the waveform display information. Marks set after an alarm goes are are called alarm marks, while marks depicting arbitrary characters are called user marks. There are 8 marks.
Scroll Bar Horizontal	If you drag the scroll bar with the mouse during data playback, you can move the time axis.
Scroll Bar Vertical	If you drag with the mouse, you can move the upper and lower area of the waveform display area.

11-4-3-1. Leaving a Scale

Displays the scale of the channel set to active in the monitor window. If you break the button the leave the scale in the monitor window, you can view several scales at once.

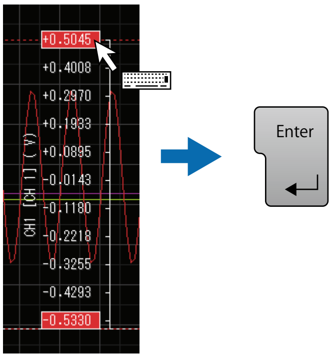

Select scale display

The scale display remains even if the active channel is changed

Monitor
CH1-1
Scale
Waveform
1s /DIV
10ms /S
CH1 [CH1-1] (V)
CH2 [CH1-2] (V)
1-2
2012-05-09 16:47:01
2012-05-09 16:47:06
2012-05-09 16:47:11
CH1-2
ON

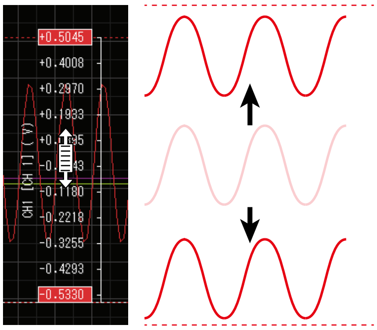
11-4-3-2. Scale Value Entry

If you click the boxes you can directly enter values. After you are finished entering the values, press the enter key to confirm.


+0.5045
-0.5330
CH1 [CH 1] (V)
Enter

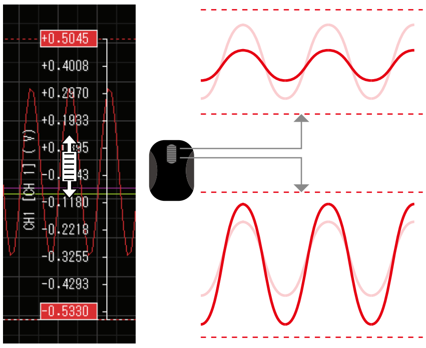
11-4-3-3. Move Scale Position

The position of the scale can be changed by dragging it with the mouse.


+0.5045
-0.5330
CH1 [CH 1] (V)

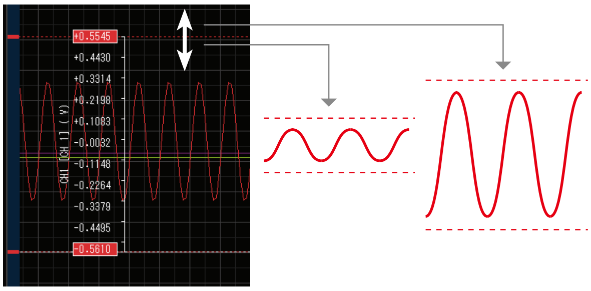
11-4-3-4. Span Zoom In/Out

When the mouse is above the scale, the mouse wheel can be used to zoom in or out of the span. (For situations where there is no mouse wheel, you can perform the same operations from the waveform section of the Control Panel).


+0.5045
+0.4008
+0.2970
+0.1933
-0.1180
-0.2218
-0.3255
-0.4293
-0.5330
CH1 [CH 1] (V)

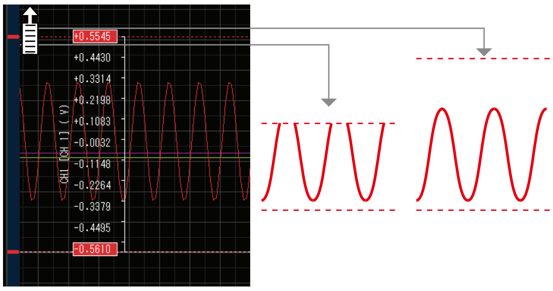
11-4-3-5. Stretch Line Zoom In/Out

If the stretch line is dragged up or down with the mouse, the wave form display width can be changed.


+0.5545
+0.4430
+0.3314
+0.2198
+0.1083
-0.0032
-0.1148
-0.2264
-0.3379
-0.4495
-0.5610
CH1 [CH 1] (V)

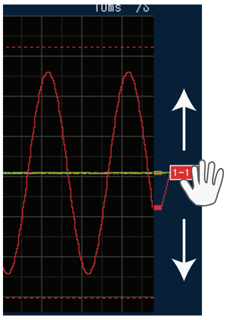
11-4-3-6. Span Slider Control

The span can be changed by dragging the span slider on the left side of the stretch line up or down with the mouse.(Span slider is then drawn in nearby grid.)


+0.5545
+0.4430
+0.3314
+0.2198
+0.1083
-0.0032
-0.1148
-0.2264
-0.3379
-0.4495
-0.5610
CH1 [CH 1] (V)

11-4-3-7. Level Bar Operation

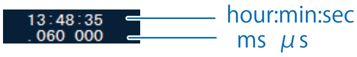
Displays all CH signal value. If the level bar is dragged with the mouse, the upper and lower values of the waveform can be changed.



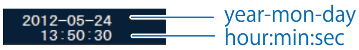
11-4-3-8. Time Scale Display Contents

The X axis displays time. The displayed information is changed to match the Time/DIV setting.

Time/DIV: below 200ms

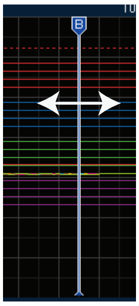


Time/DIV: more than 500ms



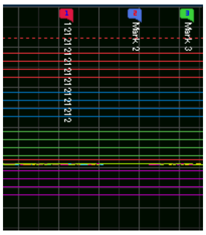
11-4-3-9. Cursor Display

While data is being played back the cursor is displayed, and above the cursor you can see the time frame, signal level, etc. There is an A cursor, and B cursor, and they can be moved left or right by dragging with the mouse.



11-4-3-10. Mark Display

During Recording you can record a mark in the waveform display information. Marks set after an alarm goes are are called alarm marks, while marks depicting arbitrary characters are called user marks. There are 8 marks. For information on entering a mark, please refer to “11-11-5-2. Mark insertion”.



* You cannot change the position of a mark once it's been entered

11-4-3-11. Scroll Bar Horizontal

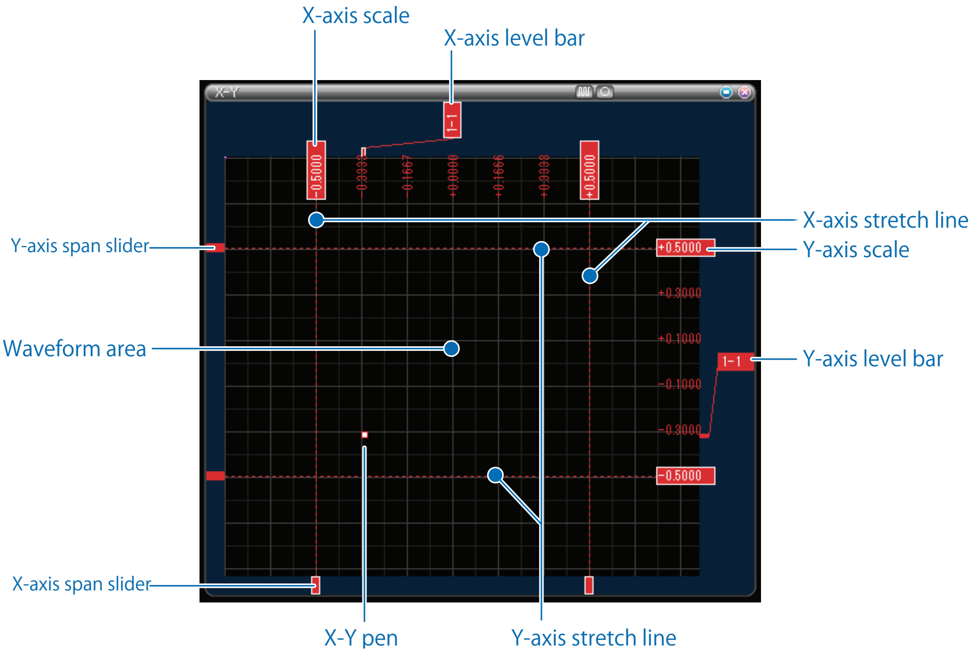
If you drag the scroll bar with the mouse during data playback, you can move the time axis.

11-4-3-12. Scroll Bar Vertical

If you drag with the mouse, you can move the upper and lower area of the waveform display area.

11-4-4. X-Y Waveform Display

After assigning the input signal to the X axis and the Y axis,the X and Y 's signal can correlatively be displayed with wave form display. The X-Y waveform can at maximum show 4 channels. The X-Y waveform can only be displayed during free running and during recording. During playback the X-Y waveform cannot be displayed.


X-axis scale
X-axis level bar
X-Y
1-1
-0.5000
-0.3333
-0.1667
+0.0000
+0.1666
+0.3333
+0.5000
X-axis stretch line
Y-axis span slider
Y-axis scale
+0.5000
+0.3000
+0.1000
Waveform area
Y-axis level bar
1-1
-0.1000
-0.3000
-0.5000
X-axis span slider
X-Y pen
Y-axis stretch line

Name	Explanation
X/Y Axis Scale	Displays the X-Y channel set to active in the Monitor window on the X and Y axises.
X/Y Axis Level Bar	Displays each channel's signal position. If the level bar is dragged with the mouse, the upper and lower values of the waveform can be changed.
X/Y Axis Stretch Line	The stretch line displays the channel set to active in the monitor window. The stretch line's upper value is found in the Span Setting's upper value, while the stretch line's lower value is found in the Span Setting's lower value.
X/Y Axis Span Slider	The wave form's span axis can be changed by dragging the span slider with the mouse up or down, and left to right.
X-Y Pen	Displays the plot of the active channel's signal value. During recording, it is drawn with a solid line.
Waveform Area	The X-Y wave form is used to draw the range. By dragging the mouse, you can control the X-Y axis values.

11-4-4-1. X/Y Axis Scale

11-4-4-2. X/Y Axis Level Bar

11-4-4-3. X/Y Axis Stretch Line

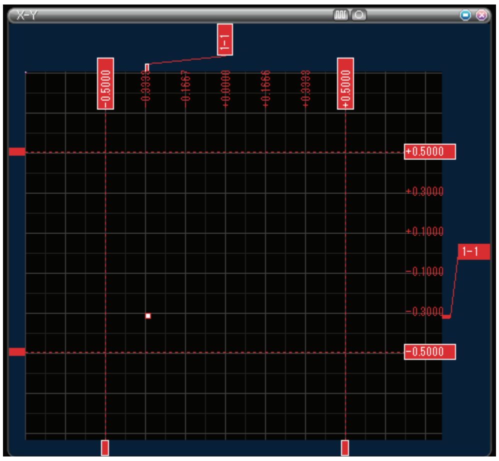
11-4-4-4. X/Y Axis Span Slider

The operation is the same as the Y-T wave form display. For information, refer to “11-4-3. Waveform Display”.

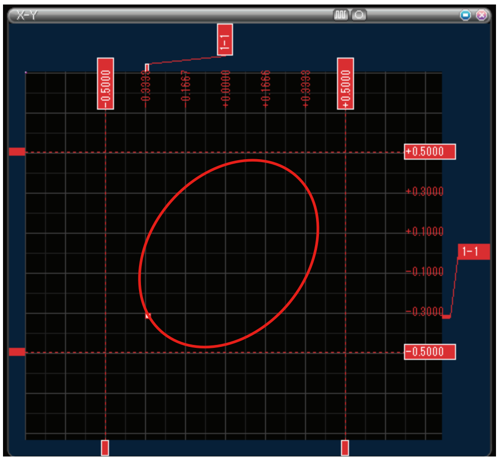
11-4-4-5. X-Y Pen

The X-Y pen shows tracking of the pen up condition during free running. Tracking is shown after recording starts.

Free running

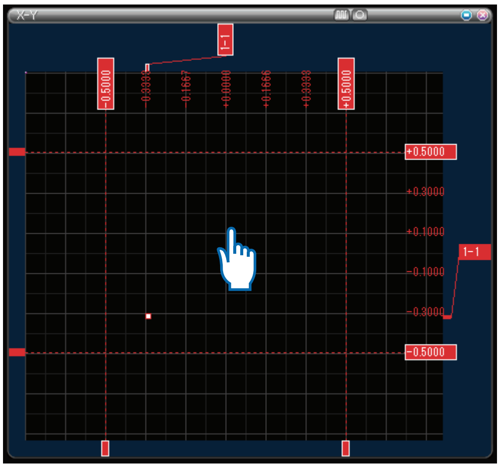

X-Y
1-1
−0.5000
−0.3333
−0.1667
+0.0000
+0.1666
+0.3333
+0.5000
+0.5000
+0.3000
+0.1000
−0.1000
−0.3000
−0.5000
1-1

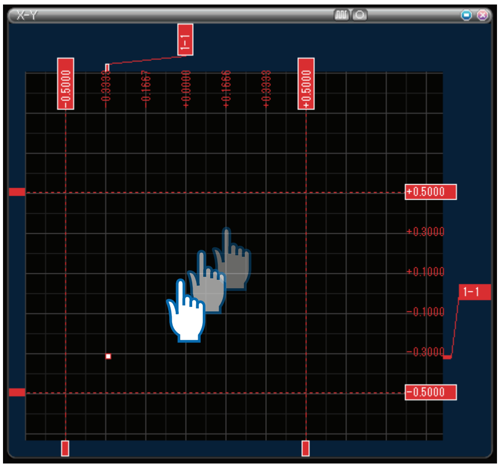
Recording..


X-Y
1-1
−0.5000
−0.3333
−0.1667
+0.0000
+0.1666
+0.3333
+0.5000
+0.5000
+0.3000
+0.1000
−0.1000
−0.3000
−0.5000
1-1

11-4-4-6. Wave Form Area

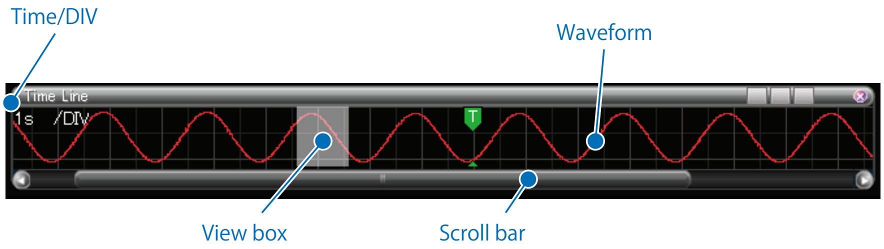
By dragging the mouse, you can control the X-Y axis values.

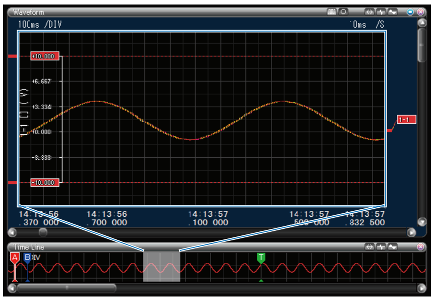

X-Y
1-1
−0.5000
−0.3333
−0.1667
+0.0000
+0.1666
+0.3333
+0.5000
+0.5000
+0.3000
+0.1000
−0.1000
−0.3000
−0.5000
1-1


X-Y
1-1
−0.5000
−0.3333
−0.1667
+0.0000
+0.1666
+0.3333
+0.5000
+0.5000
+0.3000
+0.1000
−0.1000
−0.3000
−0.5000
1-1

11-5. Time Line Window

You can use the Y-T wave form window to view everything. The digital monitor allows 1 channel's wave form to be displayed.


Time/DIV
Waveform
Time Line
1s /DIV
T
View box
Scroll bar

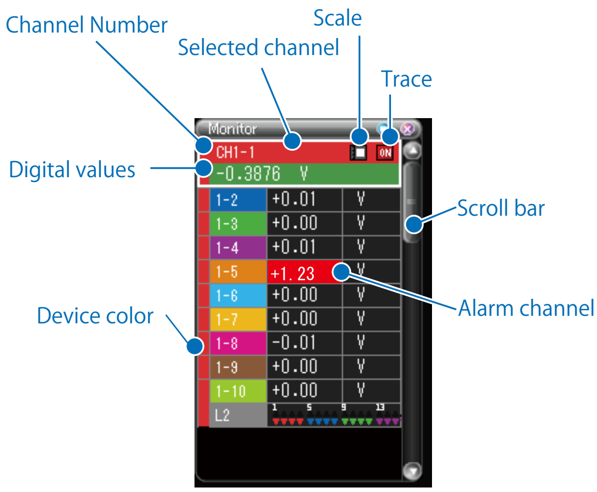
Name	Explanation
Time/DIV Display	Display the Time/DIV value of the currently displayed waveform. Time/DIV displays time to one 1 grid axis. For 1sec/DIV1 grid's display axis is 1 second.
Waveform Display	Displays the waveform. The active channel's wave form is displayed on the digital monitor.
View Box	The wave form display windows display range is shown in a semi-translucent box. The wave form display windows display value can be changed by dragging it with the mouse.  Waveform 100ms /DIV 0ms /S Time Line
Scroll Bar	If you drag the scroll bar with the mouse during data playback, you can move the time axis.

11-6. Monitor Window

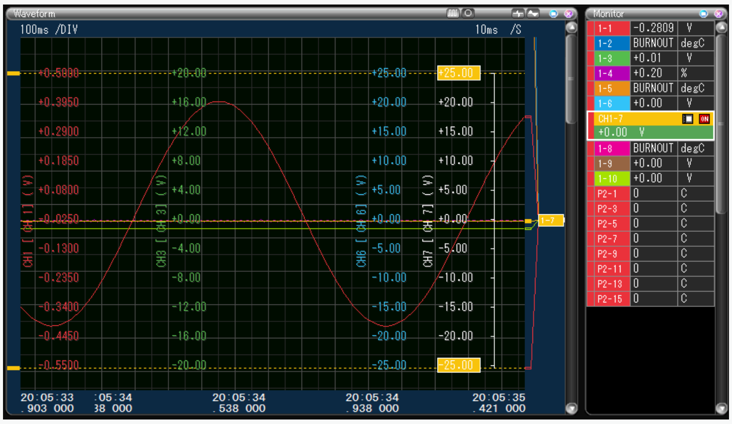
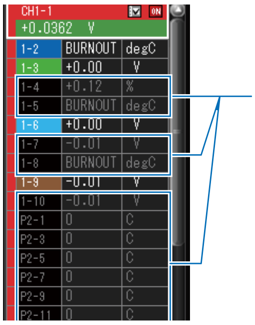
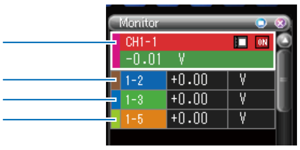
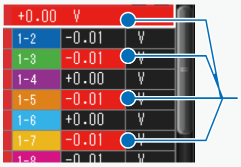
This window displays the signal's level value. During free running or recording, new information is updated every 0.5 seconds During playback, selecting either cursor A or B will display the signal level value of the chosen cursor. Depending on the window size, all modes(normal, wide, big) can be used.

11-6-1. Normal

This display mode shows wave form displays lined up with each other.

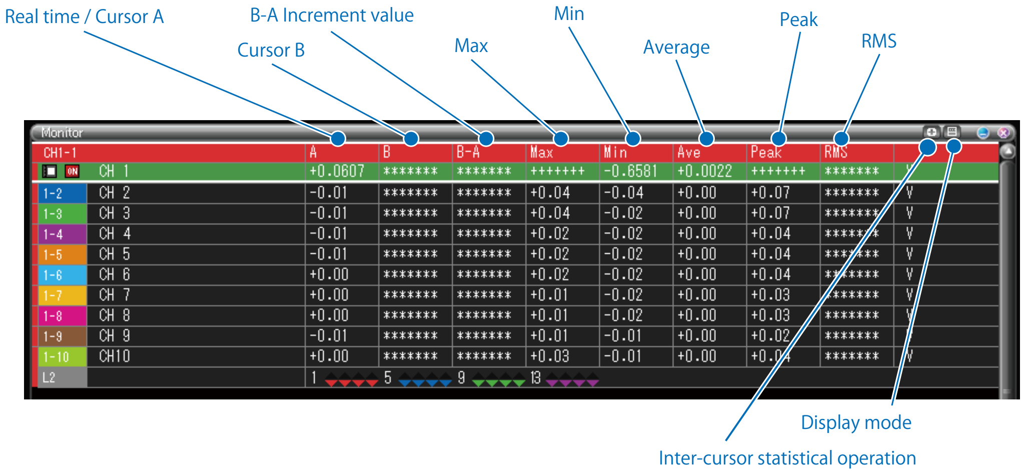

Channel Number
Scale
Selected channel
Trace
Digital values
Scroll bar
Alarm channel
Device color
Monitor
CH1-1
-0.3876 V
1-2 +0.01 V
1-3 +0.00 V
1-4 +0.01 V
1-5 +1.23 V
1-6 +0.00 V
1-7 +0.00 V
1-8 -0.01 V
1-9 +0.00 V
1-10 +0.00 V
L2

<table>
<tr><th>Name</th><th>Explanation</th></tr>
<tr><td>Channel Number</td><td>The displayed channel's number and wave form color are displayed. The channel number is [module Number]-[Channel Number].</td></tr>
<tr><td>Selected Channel</td><td>From the selected channel, you can view the next item, or operate it. By pressing the keyboard's Shift key or Ctrl key and clicking the mouse at the same time, multiple channels can be selected at once.
*Channel by which multiple selection was made cannot be operated.
<table>
<tr><td>Waveform Window</td><td>Display in front
Scale Display
Stretch Line Display</td></tr>
<tr><td>Time Line Window</td><td>Waveform Display</td></tr>
<tr><td>Monitor Window</td><td>Scale Change
Trace Change
Group Creation</td></tr>
</table></td></tr>
<tr><td>Digital Values</td><td>Displays signal level during free running, recording, or playback.
<table>
<tr><td>Free running
Recording</td><td>Displays the newest entered signal level from a device. It is refreshed every 0.5 seconds.</td></tr>
<tr><td>Review</td><td>Selecting either cursor A or B will display the signal level value of the chosen cursor.</td></tr>
</table></td></tr>
</table>

Scale Change	Pressing the scale button with leave the scale display in the waveform window. You can display the scale of all channels where the scale button has been pushed. 
Trace Change	Pressing the trace button allows the chosen channel's wave forms to be displayed. Even if it not being displayed, there is no effect on the recording data.  Trace Off channel (Undisplayed)
Scroll Bar	The channel display can be moved by dragging it up or down with the mouse.
Device Color	Connected devices and files being played are automatically assigned colors as device colors. In the event assigned device colors become mixed in monitor windows according to group function, it is possible to view which device the signal belongs to. For information on group functions, refer to "13-1. Group functions". Device A Device B Device C Device D 
Alarm Channel	Channels where an alarm has gone off will be Displayed with a red background.  Alarm channel

11−6−2. Wide

This mode is a wide range display that does not show waveform display. In wide display, statistics calculations can be performed.

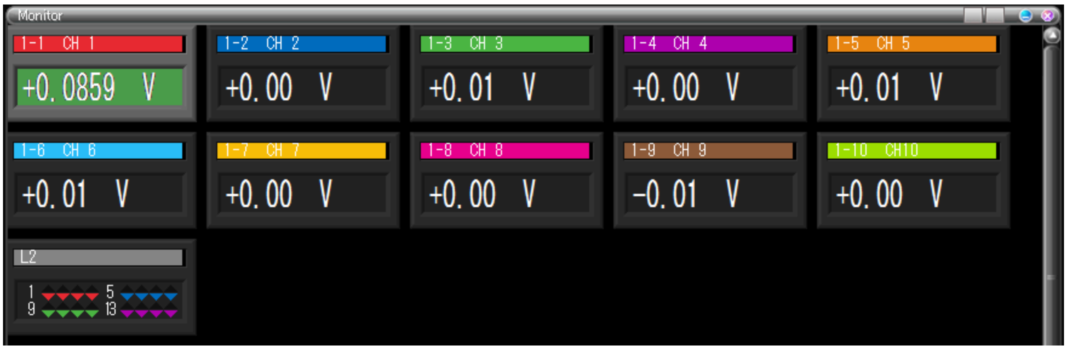


CH1-1		A	B	B-A	Max	Min	Ave	Peak	RMS	
■ ON	CH 1	+0.0607	*******	*******	+++++++	-0.6581	+0.0022	+++++++	*******	V
1-2	CH 2	-0.01	*******	*******	+0.04	-0.04	+0.00	+0.07	*******	V
1-3	CH 3	-0.01	*******	*******	+0.04	-0.02	+0.00	+0.07	*******	V
1-4	CH 4	-0.01	*******	*******	+0.02	-0.02	+0.00	+0.04	*******	V
1-5	CH 5	-0.01	*******	*******	+0.02	-0.02	+0.00	+0.04	*******	V
1-6	CH 6	+0.00	*******	*******	+0.02	-0.02	+0.00	+0.04	*******	V
1-7	CH 7	+0.00	*******	*******	+0.01	-0.02	+0.00	+0.03	*******	V
1-8	CH 8	+0.00	*******	*******	+0.01	-0.02	+0.00	+0.03	*******	V
1-9	CH 9	-0.01	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-10	CH10	+0.00	*******	*******	+0.03	-0.01	+0.00	+0.04	*******	V
L2		1 ▼▼▼▼ 5 ▼▼▼▼ 9 ▼▼▼▼ 13 ▼▼▼▼								

Name	Explanation
Real Time/Cursor A Value	Displays the newest real time signal level value from free running or recording in progress. Signal level is displayed above cursor A during playback.
Cursor B Value	Signal level is displayed above cursor A during playback.
B-A Increment value	Displays Cursor B and Cursor A's increment value during playback.
Max Value Min Value Average Value Peak Value	Show the Maximum Value, Minimum Value, Average Value, Peak to Peak Value during free running, recording, or playback. Free−running: Displays the value after free−running starts. Recording: Displays the value after recording starts and and the trigger is activated. Review: Performs the calculations for statistics where the cursor is, and displays them.
RMS (Root Mean Squared) value	Performs statistics operation for the area between cursors in playback, and displays root mean squared value.
Inter-cursor statistical operation	Performs the statistics operation for the area between Cursor A and Cursor B during statistics operation playback for cursor area.
Display Mode	Changes to big mode display.

11-6-3. Big

You can increase the size of the characters during wide display mode.



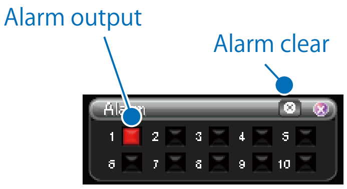
```
1-1  CH 1        1-2  CH 2      1-3  CH 3      1-4  CH 4      1-5  CH 5
+0.0859  V       +0.00  V       +0.01  V       +0.00  V       +0.01  V

1-6  CH 6        1-7  CH 7      1-8  CH 8      1-9  CH 9      1-10  CH10
+0.01  V         +0.00  V       +0.00  V       -0.01  V       +0.00  V

L2
1     5
9    13
```

11-7. Alarm Output Window

Displays the Alarm Output Lamp. Displays the alarm data of the selected cursor during playback.

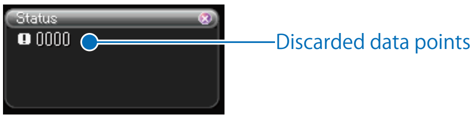


Name	Explanation
Alarm output	The output port of an alarm that has been triggered will be lit up red.
Alarm Clear	If the alarm clear is used when alarm hold setting is set to On for free-running or currently recording device, the triggered alarm will be cleared. For Alarm hold settings, please refer to "12-5. Alarm settings".

11-8. Recording Information Window

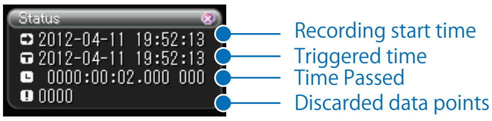
Displays time passed or time remaining during recording. Displays the time of the recording data during playback.

11−8−1. Free-running in Progress


Status
0000

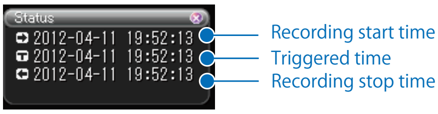
Name	Explanation
Discarded Data Points	Discarded Data Count When Free-running data is sent from the device in real time, the amount of data that could not be sent in time is counted and displayed. When the Discarded Data Count is counted up, the free-running recording data are not being sent in time, so please select a lower sampling time.

11−8−2. Recording


Status
2012-04-11 19:52:13
2012-04-11 19:52:13
0000:00:02.000 000
0000

Name	Explanation
Recording Start Time	Displays the time that recording was started.
Triggered Time	Displays the time that the start trigger is activated.
Time Passed	Displays the amount of time that has passed since the trigger activated.
Discarded Data Points	Discarded Data Count When Free-running data is sent from the device in real time, the amount of data that is sent in time is counted and displayed. When the Discarded Data Count is counted up, the free-running recording data are not being sent in time, so please select a lower sampling time. When recording to the GL device itself, there is no effect on the data in the device.

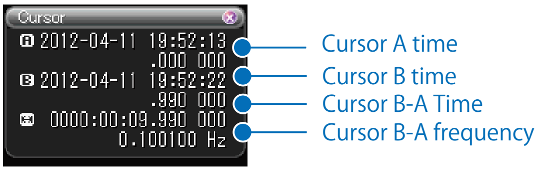
11−8−3. Review


Status
2012-04-11 19:52:13
2012-04-11 19:52:13
2012-04-11 19:52:13

Name	Explanation
Recording Start Time	Displays the time that recording was started.
Triggered Time	Displays the time that the start trigger is activated.
Recording Stop Time	Displays the time when recording was stopped.

11-9. Cursor Information Window

Displays time information above Cursor A or Cursor B during playback.


Cursor
Cursor A time
Cursor B time
Cursor B-A Time
Cursor B-A frequency

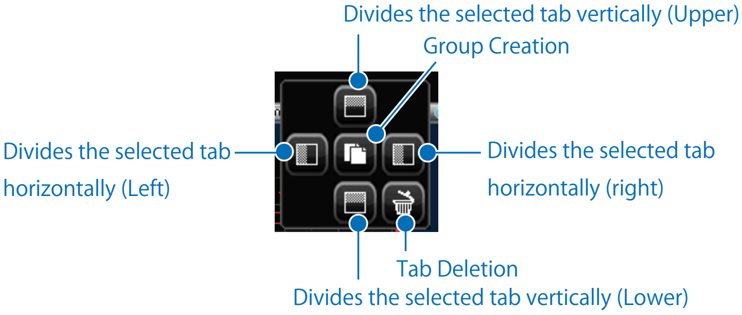
```
A 2012-04-11 19:52:13
                .000 000
B 2012-04-11 19:52:22
                .990 000
   0000:00:09.990 000
          0.100100 Hz
```

Name	Explanation
Cursor A time Cursor B time	Displays the time informations above the various cursors. Or, if the [A] or [B] is pressed, the A and the B Cursors will move to display waveform and, Cursor A and B's time also changes to the point that was moved to.
Cursor B-A Time	Displays the time for Cursor B-A
Cursor B-A Time Difference Frequency	Displays the frequency for Cursor B-A

11-10. Other Windows

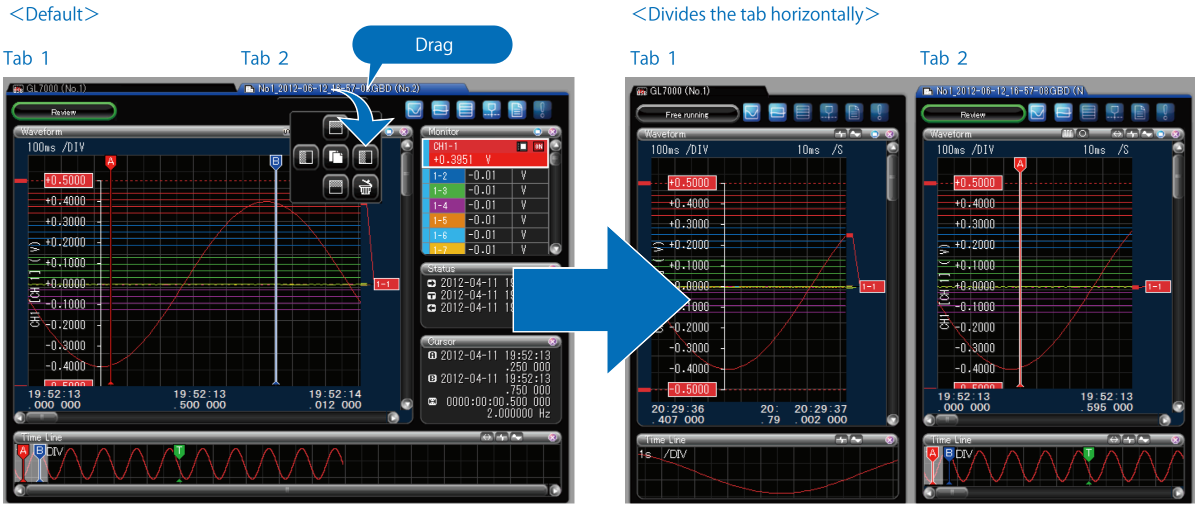
11-10-1. Navigation Window

The Drag function for tabs or digital monitor windows can be performed by accessing the Navigation Window. In the Navigation Window, you can divide the screen into sections, or create group tabs.


Divides the selected tab vertically (Upper)
Group Creation
Divides the selected tab horizontally (Left)
Divides the selected tab horizontally (right)
Tab Deletion
Divides the selected tab vertically (Lower)

Name	Explanation
Divides the selected tab	The main window can be separated into up to 4 sections. Dragging into the upper, lower, left, or right section of the screen will create divisions. In order to divide the screen, at least 2 tabs must be open.
Group Creation	By dragging tabs or digital monitor channels group tabs can be created. For information, refer to "13-1. Group functions".
Tab Deletion	Tabs can be deleted by dragging the tab to the navigation windows Delete button. If a device tab is deleted, the device will become disconnected. If a file tab is deleted, the playback will stop.

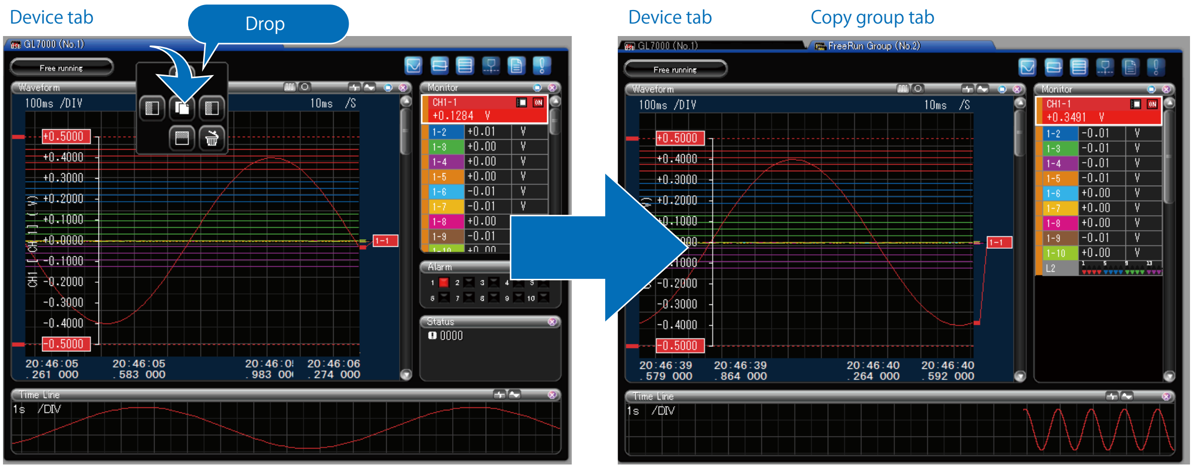
11-10-1-1. Divided Screen


<Default>
Tab 1
Tab 2
Drag
<Divides the tab horizontally>
Tab 1
Tab 2

When the Tab 2 is dragged on "Right Section" in the active navigation window, the two-screen section display that the tab 2 is placed on the right side appears.

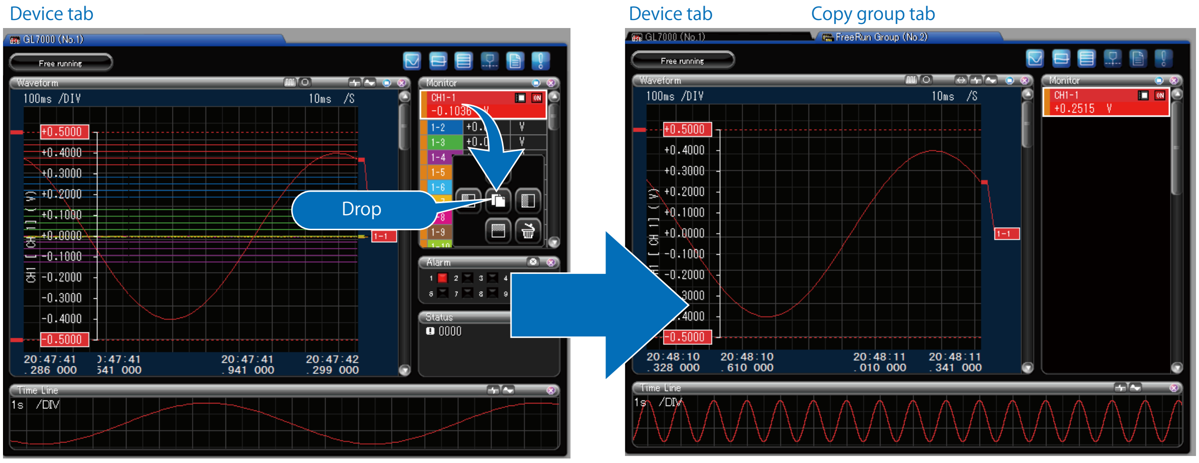
11-10-1-2. Screen with Group Tabs

<Example of group creation from the Device tab>


Device tab
Drop
Device tab
Copy group tab
GL7000 (No.1)
FreeRun Group (No.2)
Free running
Waveform
Monitor
Alarm
Status
Time Line

When the Device tab is dropped into “group creation“ in the navigation window, the group tab that the Equipment tab is copied is created.

<Example of group creation from the Monitor Window channel>


Device tab
Drop
Device tab
Copy group tab
GL7000 (No.1)
FreeRun Group (No.2)
Free running
Waveform
Monitor
Alarm
Status
Time Line

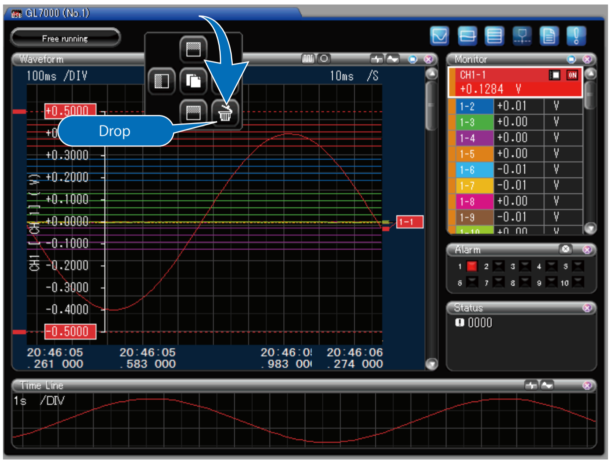
When the channel on the monitor window is selected and then dropped into “Group Creation” in the navigation window, the group tab that the selected channel is copied is created, and the Waveform Display with the selected channel only appears.

*When canceling a group window, please delete the group tab using the follow "Tab Deletion Screen"

*CH cannot copy in the state of Trace OFF.Please copy in the state of Trace ON.

11-10-1-3. Tab Deletion Screen

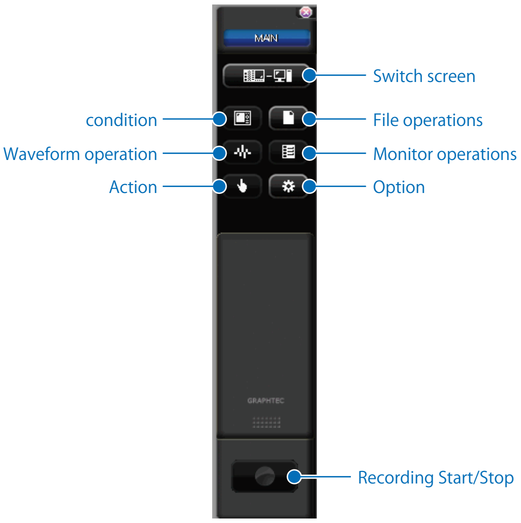
<Delete tab>


Drop
GL7000 (No.1)
Free running
Waveform
Monitor
Alarm
Status
Time Line

By dropping any tab into “Tab Deletion”, the tab display is deleted.

11-11. Main Screen Control Panel

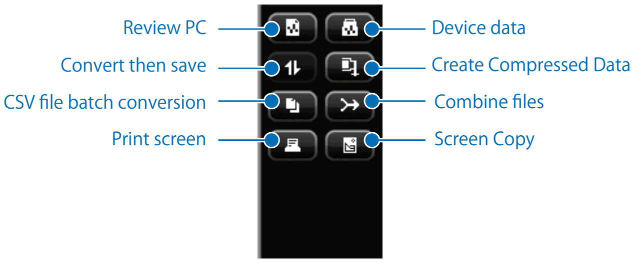
11-11-1. Main Panel


MAIN
Switch screen
condition
File operations
Waveform operation
Monitor operations
Action
Option
GRAPHTEC
Recording Start/Stop

Name	Explanation
Switch Screen	Connection window and Main window are changed.
Condition Settings	Set options for main module. This is available when a Device Tab is selected. For Device Settings, please refer to "12. Device Settings".
File Operations	Change to panel related to file.
Waveform Operations	Change to panel related waveform operation.
Monitor Operations	Changes to monitor related panel.
Action	Changes to action related panel.
Option	Changes to option related panel.
Recording Start/Stop	To start/stop recording. You can only perform starting and stopping from the Device Tab.

11-11-2. File Operations

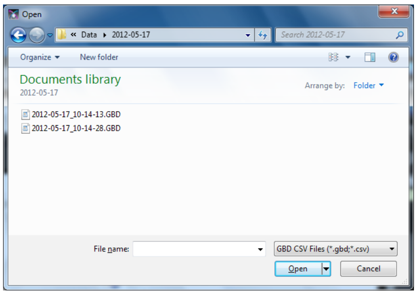
Changes to file related panel.


Review PC
Device data
Convert then save
Create Compressed Data
CSV file batch conversion
Combine files
Print screen
Screen Copy

Name	Explanation
Review PC	Play backs a file recorded to the PC
Device Data	Data from the main module can be manipulated or played back. Only available when the device is connected.
Convert then save	Saves changes to the file being played back.
Create Compressed Data	Create a separate compressed version of the main file, where the function response during playback in improved.
CSV file batch conversion	Changing the formats of multiple GBD (binary) files to CSV (text) format as a batch.
Combine files	Connect multiple GBD (binary) files above the time axis. Only possible for files with the same conditions.
Print screen	Waveforms can be printed on a printer. To print,the PC must be in a mode that allows printing.
Screen Copy	The displayed screen will be saved as a BMP file.

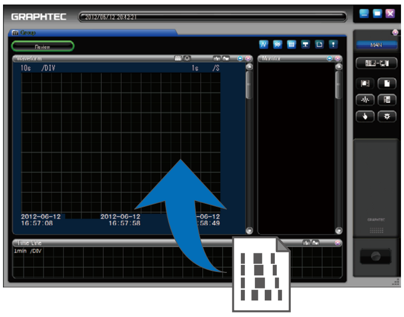
11-11-2-1. Review PC

Play back a file recorded to the PC. Please select a file to be played back. To play back a file it must be either a GBD (Binary) format device file supported by GL-Connection, or a CSV (Text) format file.


Open
« Data ▸ 2012-05-17
Search 2012-05-17
Organize ▾
New folder
Documents library
2012-05-17
Arrange by: Folder ▾
File name:
GBD CSV Files (*.gbd;*.csv)
Open
Cancel

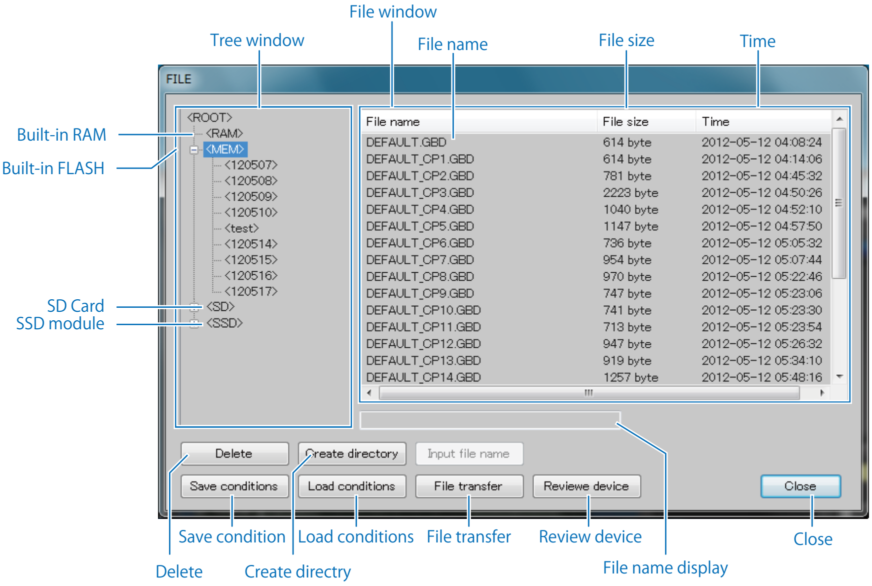
2012-05-17_10-14-13.GBD
2012-05-17_10-14-28.GBD

Also, the file can be played by directly dragging and dropping the file to the main window.



11-11-2-2. Main Module Data

Data from the main module can be manipulated or played back. Only available when the device is connected. It is possible to initialize a device from GL-Config.


File window
Tree window
File name
File size
Time
Built-in RAM
Built-in FLASH
SD Card
SSD module
FILE
<ROOT>
<RAM>
<MEM>
<120507>
<120508>
<120509>
<120510>
<test>
<120514>
<120515>
<120516>
<120517>
<SD>
<SSD>
Delete
Create directory
Input file name
Save conditions
Load conditions
File transfer
Reviewe device
Close
Save condition
Load conditions
File transfer
Review device
Close
File name display
Delete
Create directry

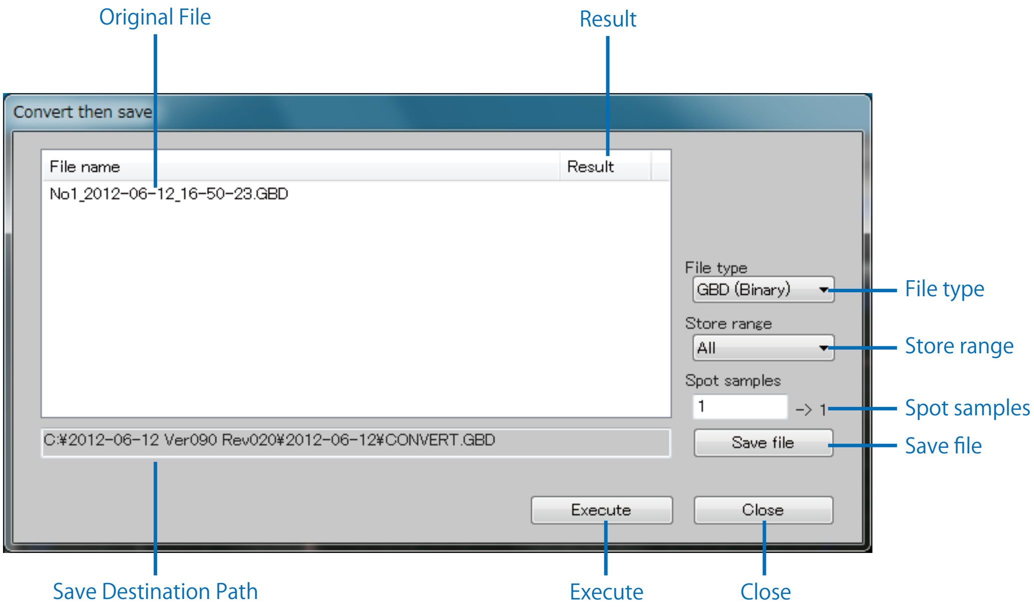
File name	File size	Time
DEFAULT.GBD	614 byte	2012-05-12 04:08:24
DEFAULT_CP1.GBD	614 byte	2012-05-12 04:14:06
DEFAULT_CP2.GBD	781 byte	2012-05-12 04:45:32
DEFAULT_CP3.GBD	2223 byte	2012-05-12 04:50:26
DEFAULT_CP4.GBD	1040 byte	2012-05-12 04:52:10
DEFAULT_CP5.GBD	1147 byte	2012-05-12 04:57:50
DEFAULT_CP6.GBD	736 byte	2012-05-12 05:05:32
DEFAULT_CP7.GBD	954 byte	2012-05-12 05:07:44
DEFAULT_CP8.GBD	970 byte	2012-05-12 05:22:46
DEFAULT_CP9.GBD	747 byte	2012-05-12 05:23:06
DEFAULT_CP10.GBD	741 byte	2012-05-12 05:23:30
DEFAULT_CP11.GBD	713 byte	2012-05-12 05:23:54
DEFAULT_CP12.GBD	947 byte	2012-05-12 05:26:32
DEFAULT_CP13.GBD	919 byte	2012-05-12 05:34:10
DEFAULT_CP14.GBD	1257 byte	2012-05-12 05:48:16

Name	Explanation
Tree Window	display all devices recognized by the main module. Built-in RAM Built-in flash SD card SSD module
File Window	A general overview of the contents of the device selected by Tree Window is displayed. File Name File Size Update Time

Delete	Deletes a folder or file.
Create directory	Creates a new folder in the designate path of the tree window.
File Name Display	Displays the file name entered during File Name Entry.
Save conditions	Saves the main settings to the main module.
Load conditions	Loads the previously saved settings file. (*Files with a different organization from the device's amp module cannot be loaded).
File transfer	Sends the file on the main module to the PC.
Review Device	Plays back the device data.
Close	Closes the display.

11-11-2-3. Convert then save

For recorded files, when there is a split and save between Cursor A-B ,the format can be changed to the CSV format.


Original File
Result
Convert then save
File name
Result
File type
Store range
Spot samples
Save file
Execute
Close
File type
Store range
Spot samples
Save file
Save Destination Path
Execute
Close

No1_2012-06-12_16-50-23.GBD

File type: GBD (Binary)

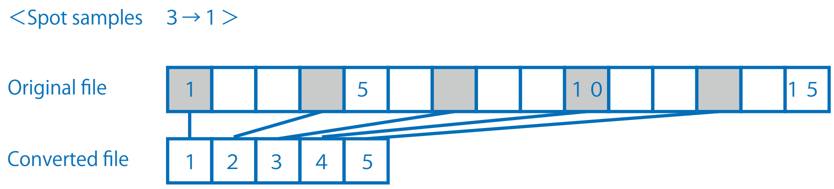
Store range: All

Spot samples: 1 -> 1

C:¥2012-06-12 Ver090 Rev020¥2012-06-12¥CONVERT.GBD

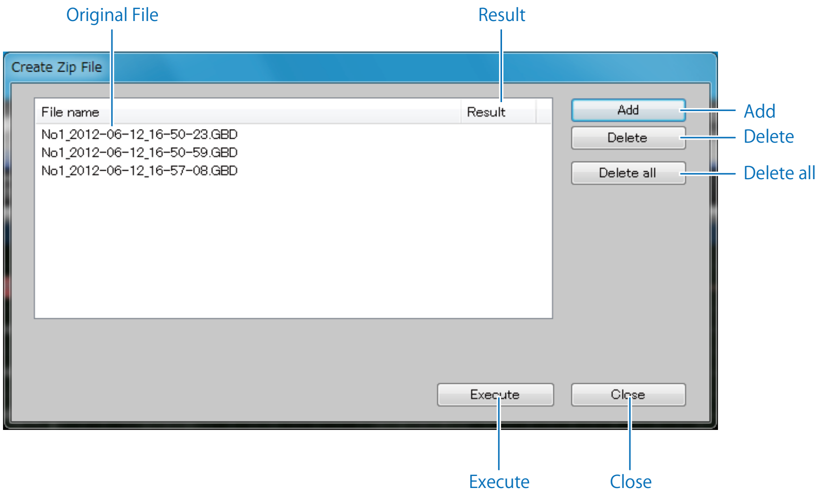
Name	Explanation
Original File	The unchanged file name is displayed.
Result	The result of the change is displayed. OK: Displayed when the change has been successful. NG: Displayed when the correct change has not taken place
File type	Select the file format to be changed. GBD (Binary Format): Changes to binary file format. It's not possible to change from CVS (Text Format) to GBD (Binary Format . CVS (Text Format): Changes to text format
Store range	Select the range to save. All: Saves all unchanged files. Cursor Area: Saves the Cursor AB area range.
Spot Samples	Saves the designated sampling points of the original file.
Save file	Sets the save destination for the file.
Save Destination Path	Displays the save destination path.
Execute	Saves all changes.
Close	Closes Save Changes window.

About Spot Samples


＜Spot samples　3→1＞
Original file
1
5
1 0
1 5
Converted file
1
2
3
4
5

11-11-2-4. Create Compressed Data

Improves the operation response during playbacks by creating a separate compressed file from a signal peak sampling from the recorded GBD file. Deleting a compressed file has no effect on the main recorded file. When recording to the PC, compressed data is automatically created. Several compressed files can be created at once by adding various files from different places. The compressed file will be created in the same place as
the original file. The name of the file will be as follows.
*name of original file_T1.GMD (10times compressed data)
*name of original file_T2.GMD (100times compressed data)
*name of original file_T3.GMD (10000times compressed data)

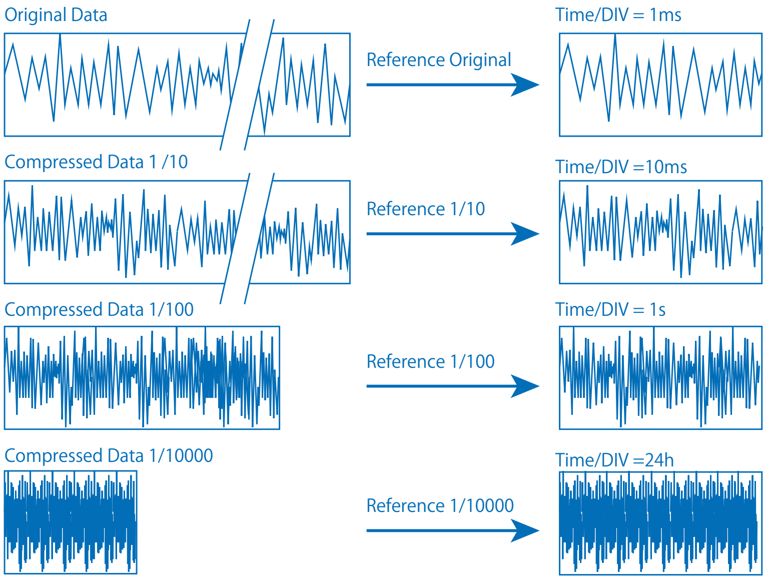

Create Zip File

File name	Result
No1_2012-06-12_16-50-23.GBD	
No1_2012-06-12_16-50-59.GBD	
No1_2012-06-12_16-57-08.GBD	

Original File
Result
Add
Delete
Delete all
Execute
Close
Add
Delete
Delete all
Execute
Close

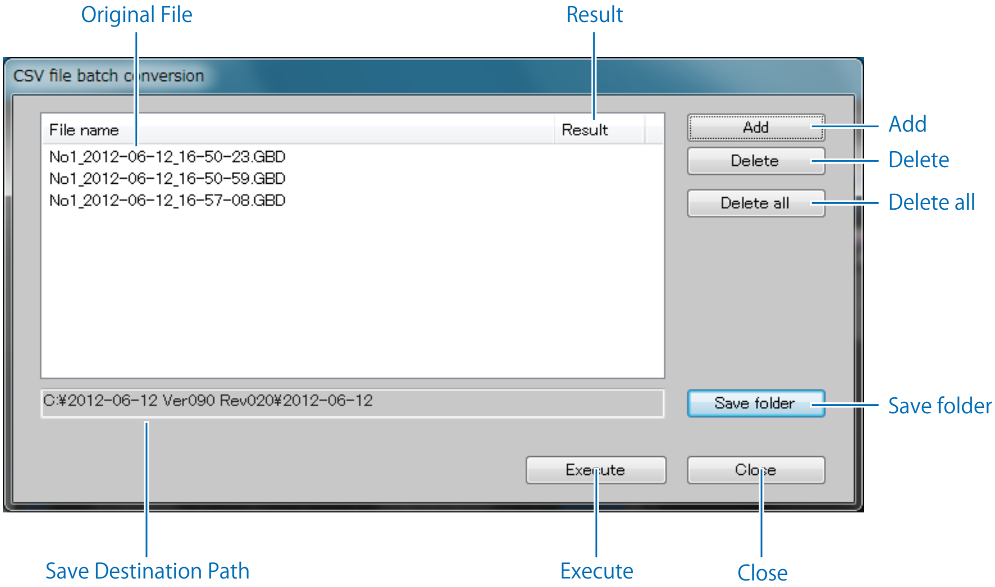
Name	Explanation
Original File	Displays the names of files being compressed.
Result	Displays the result of the processing. OK: Displayed when the processing has been successful. NG: Displayed when the correct processing has not taken place.
Add	To add a file to the list of files displayed It is possible to compress multiple files at the same time.
Delete	To delete a file from the list of files displayed.
Delete all	To delete all the files displayed in the list.
Execute	To execute conversion procedure.
Close	To close the window for file compression.

The relationship between compressed data and Time/DIV Example
Speeds up the operational response by reading the optimal compressed data from the displayed Tim/DIV.


Original Data
Reference Original
Time/DIV = 1ms
Compressed Data 1 /10
Reference 1/10
Time/DIV =10ms
Compressed Data 1/100
Reference 1/100
Time/DIV = 1s
Compressed Data 1/10000
Reference 1/10000
Time/DIV =24h

11-11-2-5. CSV file batch conversion

Changing the formats of multiple GBD (binary) files to CSV (text) format as a batch.


Original File
Result
CSV file batch conversion
File name
Result
Add
Delete
Delete all
Save folder
Execute
Close
Add
Delete
Delete all
Save folder
Save Destination Path
Execute
Close

No1_2012-06-12_16-50-23.GBD
No1_2012-06-12_16-50-59.GBD
No1_2012-06-12_16-57-08.GBD

C:¥2012-06-12 Ver090 Rev020¥2012-06-12

Name	Explanation
Original File	Displays the name of the file being converted.
Result	Displays the result of the processing. OK: Displayed when the processing has been successful. NG: Displayed when the correct processing has not taken place.
Add	To add a file to the list of files displayed.
Delete	To delete a file from the list of files displayed.
Delete all	To delete all the files displayed in the list.
Execute	To execute conversion procedure.
Close	To close the CSV batch conversion window.

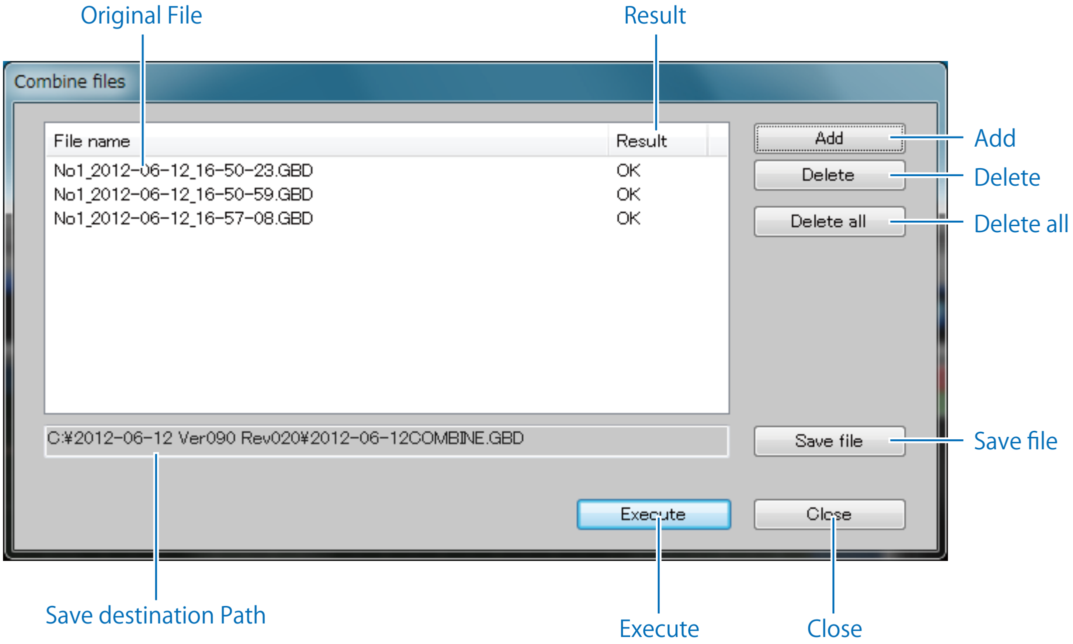
11-11-2-6. Combine Files

To connect multiple GBD (binary)files along the temporal axis. The requirement for the recorded files is that this only works for identical files.

Conditions for files that are able to be connected

- Same Amplifier Modules
- Same channel configuration

File settings like sampling, annotations and user marks settings will follow those of the file at the top of the list.


Original File
Result
Combine files
Add
Delete
Delete all
Save file
Execute
Close
Add
Delete
Delete all
Save file
Save destination Path
Execute
Close

File name	Result
No1_2012-06-12_16-50-23.GBD	OK
No1_2012-06-12_16-50-59.GBD	OK
No1_2012-06-12_16-57-08.GBD	OK

C:¥2012-06-12 Ver090 Rev020¥2012-06-12COMBINE.GBD

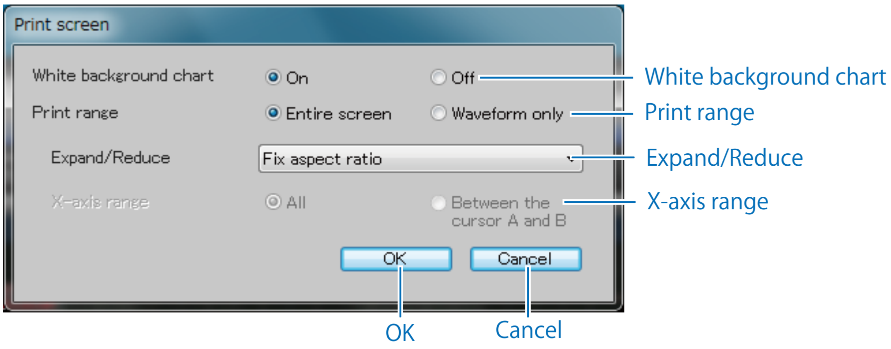
Name	Explanation
Original File	Displays the names of files being connected.
Result	Displays the result of the processing. OK: Displayed when the processing has been successful. NG: Displayed when the correct processing has not taken place.
Add	To add a file to the list of files displayed.
Delete	To delete a file from the list of files displayed.
Delete all	To delete all the files displayed in the list.
Execute	To execute connection procedure.
Close	To close the file connection window.

11-11-2-7. Print Screen

To print the screen displayed or waveform data using a printer. To print, the PC must be in a mode that allows printing.
The printing process will occur according to the sequence as follows.

(1) Print window[OK] → (2) Window standard print screen[OK] → (3) Multi-page printing confirmation → (4) Print

Print window



Print screen

White background chart ● On ○ Off

Print range ● Entire screen ○ Waveform only

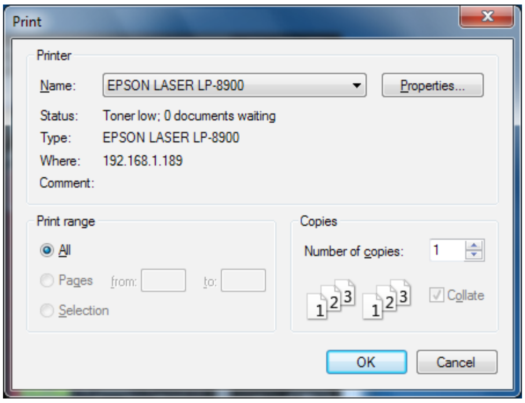
Expand/Reduce: Fix aspect ratio

X-axis range ● All ○ Between the cursor A and B

<table>
<tr><th>Name</th><th colspan="2">Explanation</th></tr>
<tr><td>White background chart</td><td colspan="2">Switch on to print the waveform window and digital monitor window with a white background.</td></tr>
<tr><td rowspan="3">Print range</td><td colspan="2">To set the range of screen that is to be printed.</td></tr>
<tr><td>Entire screen</td><td>To print everything that is displayed on the screen. Select this to print everything that you see on the screen.</td></tr>
<tr><td>waveform only</td><td>Can only print the waveform window during data playback. Everything including the scroll bar in the waveform window will be printed.</td></tr>
<tr><td rowspan="6">Expand/Reduce</td><td colspan="2">Will be effective when the print range is set to full screen.</td></tr>
<tr><td>Fix aspect ratio</td><td>Fit to printing paper when maintaining the aspect ratio.</td></tr>
<tr><td>Fit to vertical width of print sheet</td><td>Print by fitting the vertical range of the print screen to that of the printing paper.</td></tr>
<tr><td>Fit to horizontal width of print sheet</td><td>Print by fitting the horizontal range of the print screen to that of the printing paper.</td></tr>
<tr><td>Fit to the print sheet</td><td>Print by fitting to the print paper, ignoring the aspect ratio of the print screen.</td></tr>
<tr><td>Fit to the print quality</td><td>Print by abjecting the screen to the performance of the printer. Cannot set to free-running mode.</td></tr>
<tr><td rowspan="3">X axis range</td><td colspan="2">Effective when the print range is set to waveform only.</td></tr>
<tr><td>All</td><td>Print all the time axis data during data playback. Before printing is initiated, it is possible to choose to print multiple pages by moving the cursor to the place in between A-B or by adjusting the Time/DIV of the wave display.</td></tr>
<tr><td>Between Cursor A and B</td><td>Print the waveform in between cursor A-B during data playback.</td></tr>
<tr><td>OK</td><td colspan="2">Completes the print window settings and displays the Window standard print screen.</td></tr>
<tr><td>Cancel</td><td colspan="2">Cancels the printing.</td></tr>
</table>

Windows standard print screen

Displays the standard Windows print screen. Choose the printer to be used here. As the properties of printers differ, please refer to individual printer's user's manual.
When done with setting, press the OK button.



Print

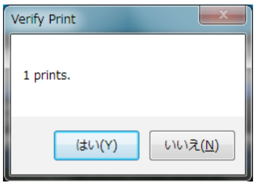
Printer
Name: EPSON LASER LP-8900
Status: Toner low; 0 documents waiting
Type: EPSON LASER LP-8900
Where: 192.168.1.189
Comment:

Print range
● All
○ Pages from: to:
○ Selection

Copies
Number of copies: 1
☑ Collate

Multi-page printing confirmation

The number of pages to be printed will be calculated according to the Print Window Settings and setting in Windows Standard Print Screen. If the number of prints are not suitable, please adjust by changing the setting in Time/DIV or reviewing the settings.

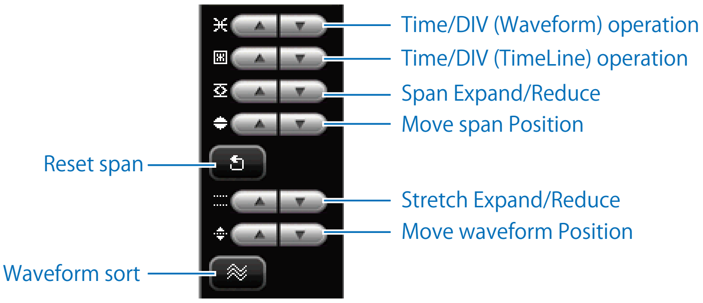


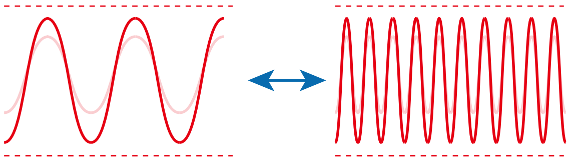
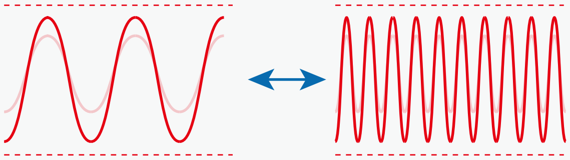
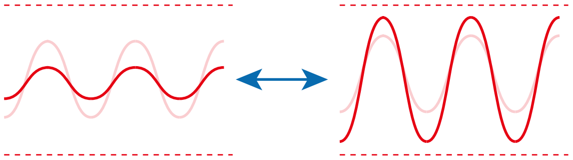
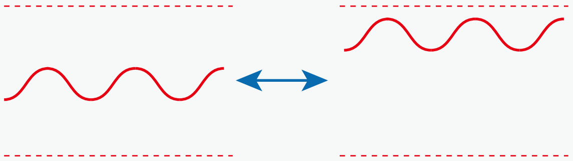
Verify Print

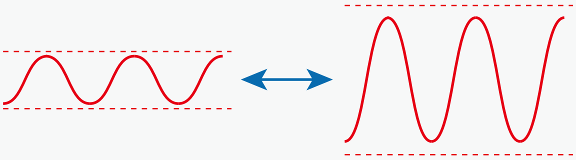
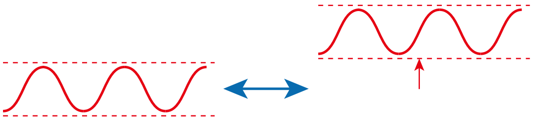
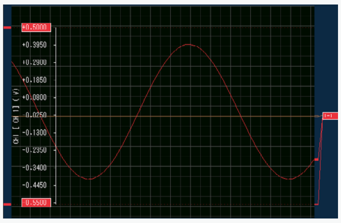
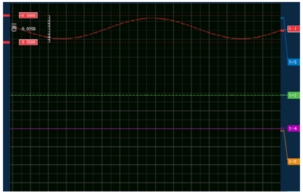
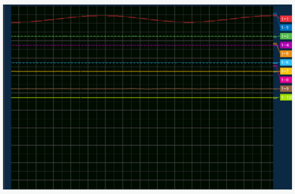
1 prints.

11-11-3. Waveform Operations

Change to panel related waveform operation.

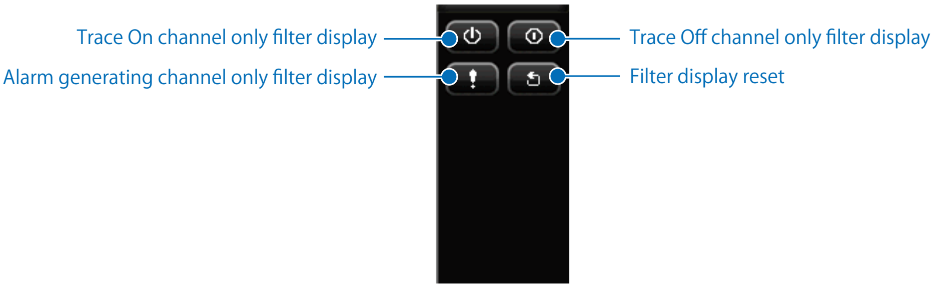

Time/DIV (Waveform) operation
Time/DIV (TimeLine) operation
Span Expand/Reduce
Move span Position
Reset span
Stretch Expand/Reduce
Move waveform Position
Waveform sort

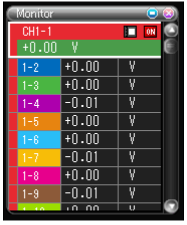
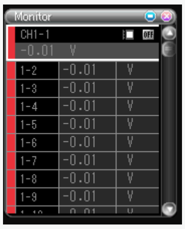
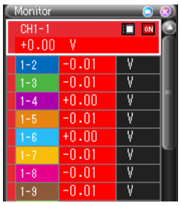
Name	Explanation
Waveform window Time/DIV operation	Operates the active tab waveform window's Time/DIV.  *Time/DIV operation during free-running or recording Changes the newly scrolled through waveforms. *Time/DIV operation during data playback When cursor A,B is displayed on the screen Changes the Time/DIV around the active cursor. When cursor A,B is displayed on the display The Time/DIV around the center of the screen will be changed.
Time Line Window Time/DIV operation	Operates the active tab time line window's Time/DIV.  Time Line Window Time/DIV operation
Span expand/reduce	Expands/reduces the span of the active channel. Changes ±10% of the full scale amount. 
Move span position	Moves the position of the active channel. Changes ±10% of the full scale amount. 
Span reset	Changes the span of the active channel back to default. Voltage:±1/2 of the full scale Temperature: from 2000° C to 200° C

<table>
<tr><td>Stretch Expand/reduce</td><td>Expands/reduces the waveform amplitude of the active channel. The expansion/reduction of the waveform will only change the amplitude and not the span value. 1 grid/2 module will be changed.
</td></tr>
<tr><td>Move waveform position</td><td>Up/down movement of the waveform Moves the waveform of the active channel up/down. The up/down movement of the waveform will only change the position of the waveform and not its span value. 1 grid/2 module will be changed.
</td></tr>
<tr><td>Waveform Sort</td><td>Changes the position of the waveform. The 3 modes will change in order. Please note that arranging the waveform will clear the settings of waveform expansion/reduction and up/down movement of the waveform.
<table>
<tr><td>Display everything on display window</td><td>Set to display everything on the waveform field.
 </td></tr>
<tr><td>Equal split of full window</td><td>Set to equally split individual channels of the full waveform window. If the number of channels does not allow equal splitting, they will appear stacked.
</td></tr>
<tr><td>Equal split of display window</td><td>Set to equally split individual channels of the displayed waveform field. If the number of channels does not allow equal splitting, they will appear stacked.
</td></tr>
</table>
</td></tr>
</table>

11-11-4. Monitor Operations

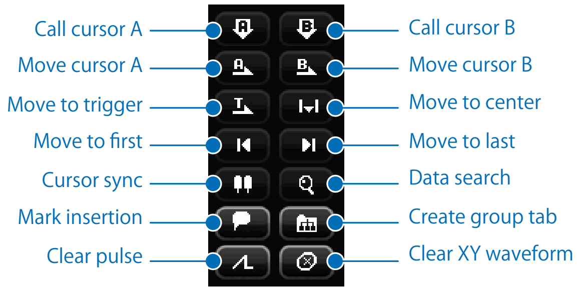
Changes to panel related to monitors.


Trace On channel only filter display
Trace Off channel only filter display
Alarm generating channel only filter display
Filter display reset

Name	Explanation
Trace On channel only filter display	Extracts and displays only the Trace On channels. All the other channels will not be displayed. Even though they are not displayed, the recorded data will not be affected.  Monitor CH1-1 ON +0.00 V 1-2 +0.00 V 1-3 +0.00 V 1-4 -0.01 V 1-5 +0.00 V 1-6 +0.00 V 1-7 -0.01 V 1-8 +0.00 V 1-9 -0.01 V
Trace Off channel only filter display	Extracts and displays only the Trace Off channels. All the other channels will not be displayed. Even though they are not displayed, the recorded data will not be affected.  Monitor CH1-1 OFF -0.01 V 1-2 -0.01 V 1-3 -0.01 V 1-4 -0.01 V 1-5 -0.01 V 1-6 -0.01 V 1-7 -0.01 V 1-8 -0.01 V 1-9 -0.01 V
Alarm generating channel only filter display	Extracts and displays only the alarm generating channels. All the other channels will not be displayed. The filter description will not change even though the channel's alarm status has been changed. Even though they are not displayed, the recorded data will not be affected.  Monitor CH1-1 ON +0.00 V 1-2 -0.01 V 1-3 -0.01 V 1-4 +0.00 V 1-5 -0.01 V 1-6 +0.00 V 1-7 -0.01 V 1-8 -0.01 V 1-9 -0.01 V
Filter display reset	Resets filter status like TraceOn, traceOff, alarm generation to their defult setting.

11-11-5. Action

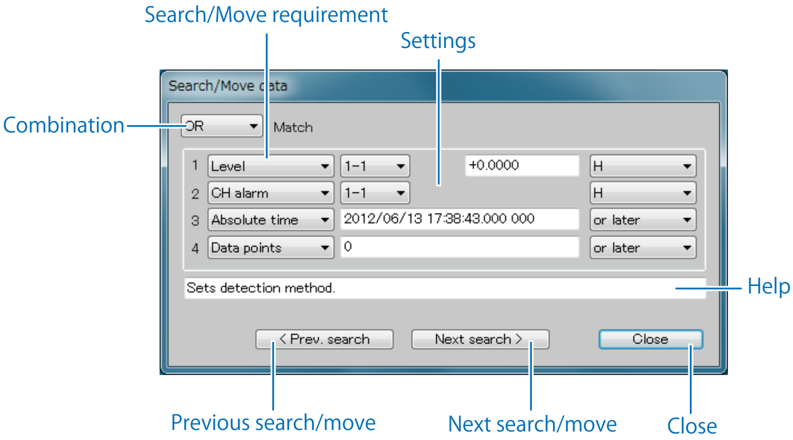
Changes to panel related to action.


Call cursor A
Move cursor A
Move to trigger
Move to first
Cursor sync
Mark insertion
Clear pulse
Call cursor B
Move cursor B
Move to center
Move to last
Data search
Create group tab
Clear XY waveform

Name	Explanation
Call Cursor A Call Cursor B	Call cursor A or cursor B to the waveform displayed. Cursor A will appear at the place 1/4 from the left of the, screen cursor B will appear at the place 3/4 from the right of the screen. Only available during playback.
Move Cursor A Move Cursor B	To move the position of cursor A or cursor B in the waveform displayed. Only available during playback.
Move to the position of start trigger	To move the position of the start trigger in the waveform displayed. Only available during playback.
Move to center Move to first position Move to last position	To move the waveform displayed to the respective positions. Only available during playback.
Cursor synchronization	To move cursor A and cursor B in synchronization with each other. Only available during playback.
Search/Move data	By combining the four main requirements, search/move data in various ways. The search starts at the position of the selected cursor and the cursor will be moved to a new position that satisfies the requirements of the search/move. Only available during playback. Refer to "11-11-5-1. Data search/move".
Mark insertion	Can insert a mark into a new data position during recording. Able to insert a maximum of 8 user marks. Every user mark has a maximum of 30characters. Refer to "11-11-5-2. Mark insertion".
Create group tab	Creates an empty group tab. For information on the group tab functions , refer to "13-1. Group functions".
Clear X-Y waveform	To clear the X-Y waveform display.

11-11-5-1. Data search/move

By combining the four main requirements, search/move data in various ways. The search starts at the position of the selected cursor and the cursor will be moved to a new position that satisfies the requirements of the search/move. This function will only be effective during playback.



OR Match

1 Level 1-1 +0.0000 H

2 CH alarm 1-1 H

3 Absolute time 2012/06/13 17:38:43.000 000 or later

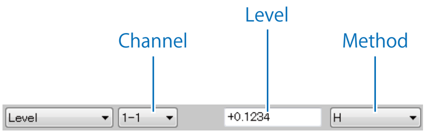
4 Data points 0 or later

Sets detection method.

Name	Explanation	
Combination	To start search/move by combining effective search/move requirements.	
	OR	Effective when either one of the effective search/move requirements is satisfied.
	AND	Effective when all of the effective search/move requirements are satisfied.
Search/move requirements	Off	Makes the search/move requirements ineffective.
	Level	Search using the level values of analog data, logic data or pulse data.
	CH alarm	Search using the alarm generation of each channel in the analog data, logic data or pulse data.
	Alarm output	Search using the alarm output.
	Absolute time	Search using absolute time.
	Relative time	Search using relative time.
	Data Points	Search using data Points.
	Mark	Search using mark.
Previous search/move	Search/move the within the previous range with the cursor selected.	
Next Search/move	Search/move the within the following range with the cursor selected.	
Close	Closes the search/move window.	
help	Explains the contents of each item in the setting.	

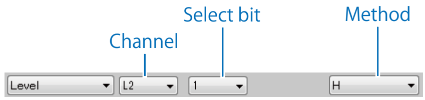
When the search/move requirements are level

<In the case of analog/pulse>


Level
Channel
Method
Level
1-1
+0.1234
H

Name	Explanation
CH Selection	To set the channel code used in search.
Level settings	To set the level used in search.
Detection method	H: Detects when the set level value is exceeded from below the set level value. L: Detects when the set level value falls under from over the set level value. or more: Detects in the range higher than the set level. or less: Detects in the range lower than the set level.

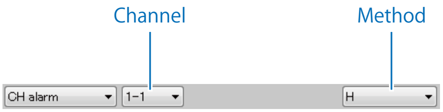
<In the case of logic>


Select bit
Method
Channel
Level
L2
1
H

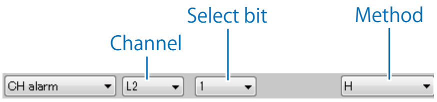
Name	Explanation
CH Selection	To set the channel code used in search.
Select bit	To set the channel code used in search.
Detection method	H: Detects when the set bit is changed from L to H. L: Detects when the set bit is changed from H to L. HL: Detects when the set bit is changed from L to H or from H to L.

When the search/move requirements are CH alarm

<In the case of analog pulse>

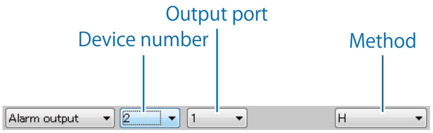

Channel
Method
CH alarm
1-1
H

<In the case of logic>


Select bit
Method
Channel
CH alarm
L2
1
H

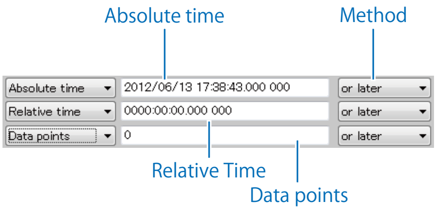
Name	Explanation
CH Selection	To set the channel code used in search.
Select bit	To set the channel code used in search.
Detection method	H: Detects when the set bit is changed from L to H. L: Detects when the set bit is changed from H to L. HL: Detects when the set bit is changed from L to H or from H to L.

When the search/move requirements are alarm output


Output port
Device number
Method
Alarm output
2
1
H

Name	Explanation
Select device number	To select the device number. The device number is the number written on the tab of the device. In the case of multiple devices with group tabs, please select one device.
Select output port	To select the alarm output port.
Detection method	H: Detects when the set bit is changed from L to H. L: Detects when the set bit is changed from H to L. HL: Detects when the set bit is changed from L to H or from H to L.

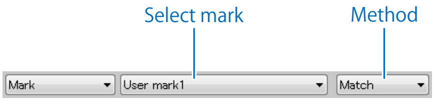
When the search/move requirements are absolute time, relative time, data points


Absolute time
Method
Absolute time
2012/06/13 17:38:43.000 000
or later
Relative time
0000:00:00.000 000
or later
Data points
0
or later
Relative Time
Data points

Name	Explanation
Absolute time setting	To set to absolute time.
Relative time setting	To set relative time from the start of the recording.
Data points setting	To set to data points.
Detection method	After:To detect the results that are after the search requirements. Before:To detect the results that before the search requirements.

It is convenient to use a combination of absolute time, relative time and data points.
For example) Everything is consistent
Search requirement 1: After 1st of October 2012
Search requirement 2: CH1-1 level 0.5V H
Detail of search: Search results that are after 1st of October 2012 and CH1-1 is higher than 0.5V.

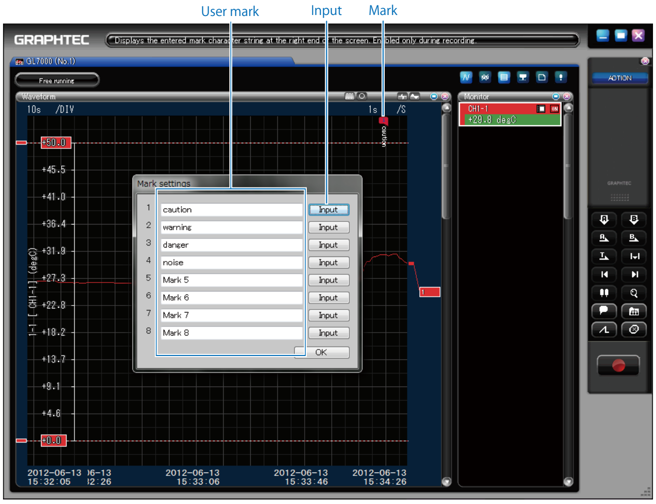
When the search requirements are marks


Select mark
Method
Mark
User mark1
Match

Name	Explanation
Select mark	To select the type of marks.
Detection method	Consistence:Register results where the set mark types are consistent.

11-11-5-2. Mark insertion

To insert mark while recording.


User mark
Input
Mark
GRAPHTEC
GL7000 (No.1)
Free running
Waveform
Monitor
ACTION

Displays the entered mark character string at the right end of the screen. Enabled only during recording.

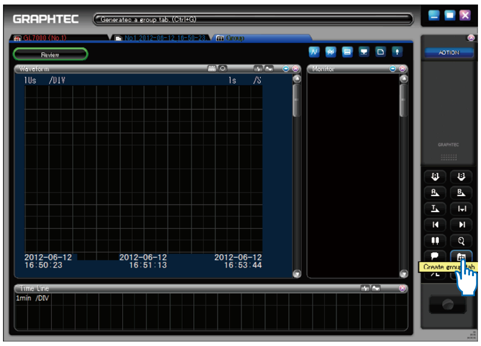
Mark settings
1 caution Input
2 warning Input
3 danger Input
4 noise Input
5 Mark 5 Input
6 Mark 6 Input
7 Mark 7 Input
8 Mark 8 Input
OK

Name	Explanation
User mark	Able to change the user mark character even while recording. However only the last character output will be remembered in the data file.
Input	When the input button is pressed, a scroll will appear on the right side of the Y-T waveform. A mark will appear at the same position during data replay.

11-11-5-3. Create group tab

The group function enables combinations of device tabs and file tabs of any channel, thus allowing freedom in presentation methods.

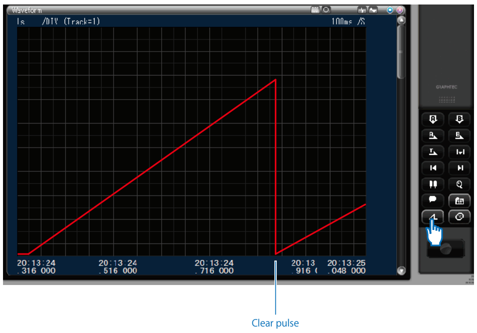
Here, a new group tab can be created. By pressing the group tab button, an empty group tab will be created. By dropping the tabs of other channels into this tab, a tab that only displays the desired channels can be created. For information on group functions, refer to “13-1. Group functions”.


GRAPHTEC
GL7000 (No.1)
No1_2012-06-12_16-50-23
Group
Review
Waveform
Monitor
ACTION
Time Line
Create group tab

Generates a group tab. (Ctrl+G)

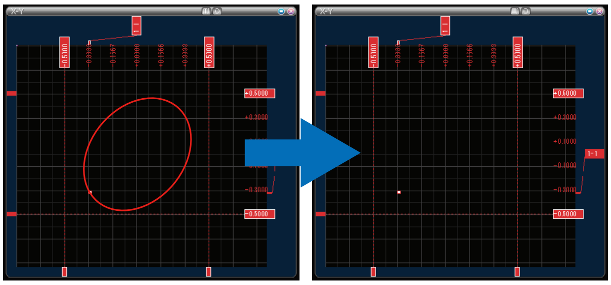
11-11-5-4. Clear pulse accumulation

To clear the pulse accumulation value. The value will also be automatically cleared when the recording starts.


Waveform
1s /DIV (Track=1)
100ms /S
20:13:24 .316 000
20:13:24 .516 000
20:13:24 .716 000
20:13 .916
20:13:25 .048 000
Clear pulse

11-11-5-5. Clear X-Y waveform

To clear the X-Y waveform display.

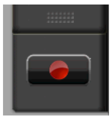


11-11-6. Option

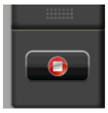
Changes to option related panel. For details on the option panel, please refer to "10-4. Control Panel for the Connection Screen".

11-11-7. Recording Start/Stop

To start/stop recording. You can only perform starting and stopping from the Device Tab.

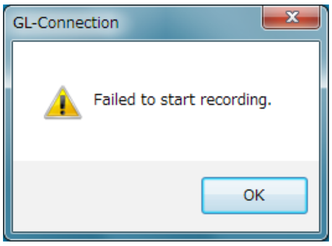


Start record button



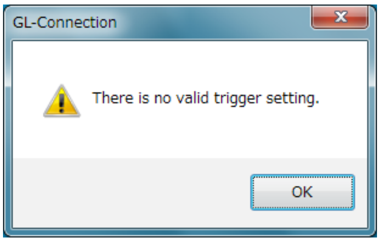
Stop record button

To check if recording has failed, perform the following steps.
*Check if the main module recording destination is correct (for example, even though an SD card is not inserted, recording destination is set as the SD card.)
*Check if PC recording destination is correct (for example, check settings have not been made to non-existent disk and pass)
*Check that the sampling value is suitable (for example, module configuration and format (GBD/CSV) etc.)
*Check the available disk space in the main module recording destination medium (Recording cannot start if the disk is full)
*Check the device tab (Recording cannot start at replay tabs, group tabs, demo etc.)
*Check that trigger conditions are correct (Recording cannot start with incorrect trigger conditions)
*Check that the main module is turned on
*Check that this application is running



GL-Connection

Failed to start recording.

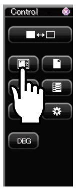


GL-Connection

There is no valid trigger setting.

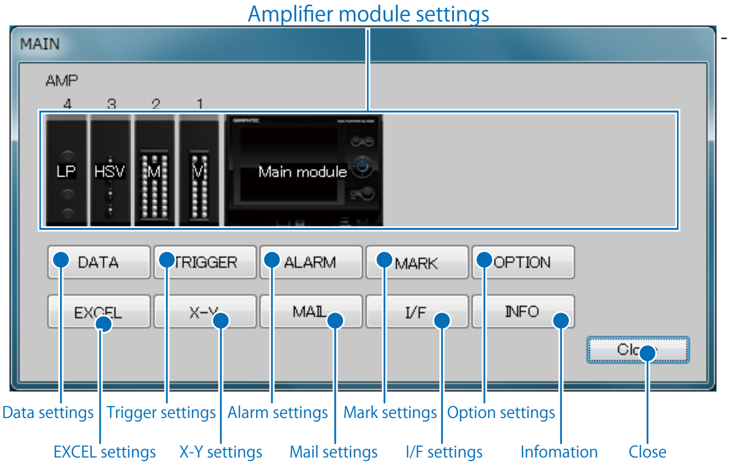
12. Device Settings

This is the screen to set recording and connection device settings. Device setting is available when the device is connected and not recording. The settings items in the following settings screen shows the setting of the device transmission when the basic parameters have been changed. To go to the device setting screen, press the control panel button in the main window.


Control
DBG

12-1. Main Settings

Individual functional buttons are shown in the main setting. By pressing a button, the window of the function will be opened.


Amplifier module settings
MAIN
AMP
4
3
2
1
LP
HSV
M
V
Main module
DATA
TRIGGER
ALARM
MARK
OPTION
EXCEL
X-Y
MAIL
I/F
INFO
Close
Data settings
Trigger settings
Alarm settings
Mark settings
Option settings
EXCEL settings
X-Y settings
Mail settings
I/F settings
Infomation
Close

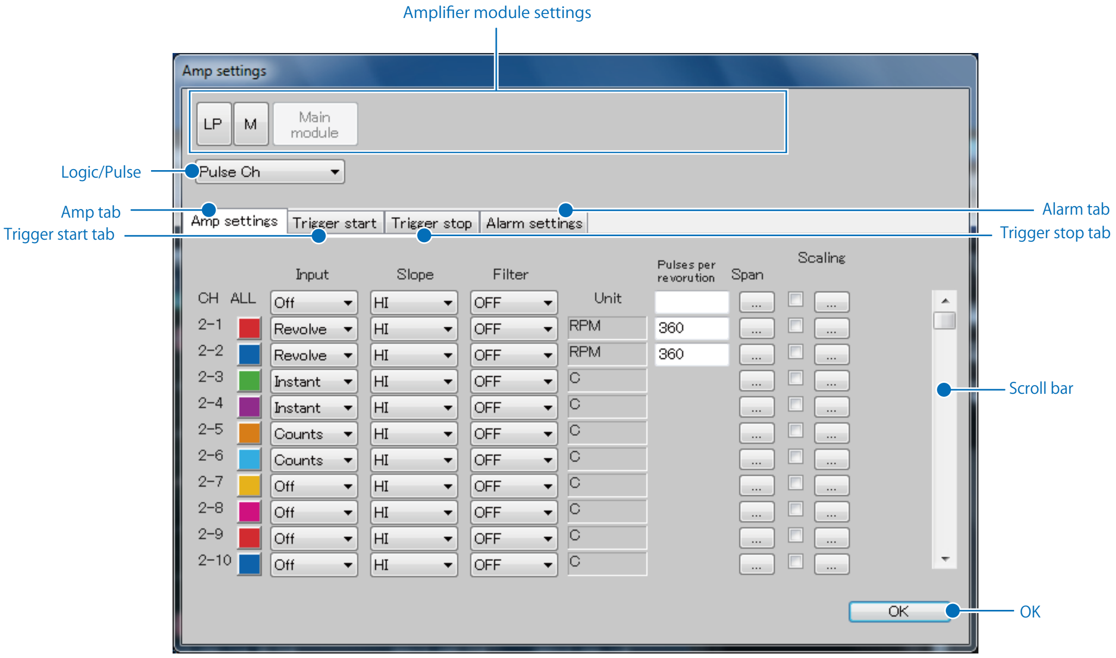
<table>
<tr><th>Name</th><th colspan="3">Explanation</th></tr>
<tr><td rowspan="6">Amplifier Module Settings</td><td colspan="3">Performs connected amplifier module setting, analog input setting, logic pulse input setting, trigger level setting, alarm level setting, etc. By pressing the connected amplifier module setting button, setting window of individual modules will be opened.</td></tr>
<tr><td>Main module Icon</td><td> </td><td>Shows the GL7000 device module. Does not operate as a button. It is displayed no matter the settings in option display.</td></tr>
<tr><td>V(Voltage) Icon</td><td> </td><td>Displayed when the voltage amplifier module is connected. The amplifier setting screen will be opened by clicking on the icon button.</td></tr>
<tr><td>M(Voltage/ Temperature) Icon</td><td> </td><td>Displayed when the voltage temperature amplifier module is connected. The amplifier setting screen will be opened by clicking on the icon button.</td></tr>
<tr><td>HSV(High Speed Voltage) Icon</td><td> </td><td>Displayed when the high speed voltage amplifier module is connected. The amplifier setting screen will be opened by pressing on the icon button.</td></tr>
<tr><td>LP(Logic Pulse) Icon</td><td> </td><td>Displayed when the logic pulse amplifier module is connected. The amplifier setting screen will be opened by pressing on the icon button.</td></tr>
<tr><td>Data settings</td><td colspan="3">Performs settings related to recording like sampling interval setting, device recording setting, PC recording setting.</td></tr>
<tr><td>Trigger settings</td><td colspan="3">Sets conditional trigger for the start and stop of recording.</td></tr>
<tr><td>Alarm settings</td><td colspan="3">Sets the requirements for signal sending to the alarm output port.</td></tr>
<tr><td>Mark settings</td><td colspan="3">Sets the marks displayed on the waveform.</td></tr>
<tr><td>Option Settings</td><td colspan="3">Configure option settings.</td></tr>
<tr><td>Excel settings</td><td colspan="3">Configure direct Excel transfer settings. For this function to work, Microsoft Excel must be installed and able to be used.</td></tr>
<tr><td>X-Y settings</td><td colspan="3">To set X-Y waveform mode.</td></tr>
<tr><td>Mail settings</td><td colspan="3">For mails that alerts the occurring of alarms when using the alarm function. To use this function, the PC must allows sending of mails. Depending on the mail-sending SMTP server, there are cases in which mails cannot be sent.</td></tr>
<tr><td>I/F setting</td><td colspan="3">To perform interface settings.</td></tr>
<tr><td>Information</td><td colspan="3">Shows information like the device version.</td></tr>
</table>

12-2. Amplifier Module Settings

Performs connected amplifier module setting, analog input setting, logic pulse input setting, trigger level setting, alarm level setting, etc. By pressing the connected amplifier module setting button, setting window of individual modules will be opened.

12-2-1. Amplifier Module Settings Screen

Can change the tabs related to the amplifier in the amplifier module settings display.

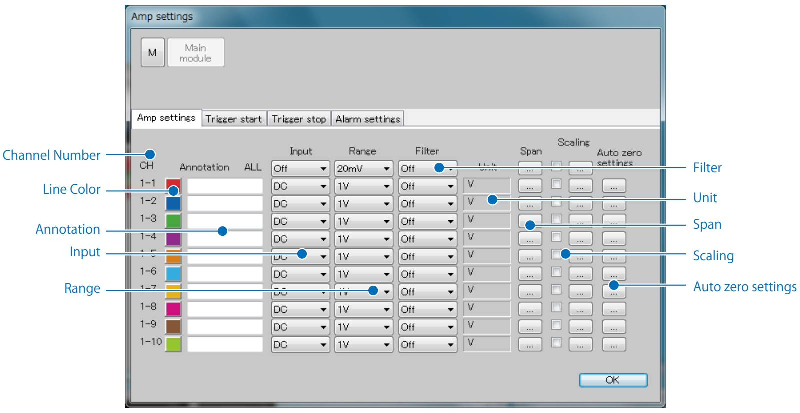

Amplifier module settings
Amp settings
LP
M
Main module
Logic/Pulse
Pulse Ch
Amp tab
Trigger start tab
Alarm tab
Trigger stop tab
Amp settings
Trigger start
Trigger stop
Alarm settings
Scroll bar
OK
OK

CH	ALL	Input	Slope	Filter	Unit	Pulses per revorution	Span	Scaling	
		Off	HI	OFF			...	☐	...
2-1	🟥	Revolve	HI	OFF	RPM	360	...	☐	...
2-2	🟦	Revolve	HI	OFF	RPM	360	...	☐	...
2-3	🟩	Instant	HI	OFF	C		...	☐	...
2-4	🟪	Instant	HI	OFF	C		...	☐	...
2-5	🟧	Counts	HI	OFF	C		...	☐	...
2-6	🟦	Counts	HI	OFF	C		...	☐	...
2-7	🟨	Off	HI	OFF	C		...	☐	...
2-8	🟪	Off	HI	OFF	C		...	☐	...
2-9	🟥	Off	HI	OFF	C		...	☐	...
2-10	🟦	Off	HI	OFF	C		...	☐	...

Name	Explanation
Amplifier Module Settings	Displays the settings of the connected amplifier module.
Logic pulse switch	Switching of logic pulse. Amplifier module only shows logic/pulse modules.
Amp tab	Configure input related settings.
Trigger-start tab	Configure Trigger-start tab related settings.
Trigger stop tab	Performs settings related to trigger stop.
Alarm tab	Performs settings related to alarm.
Scroll Bar	Appears when more than 10 channels are displayed in the amplifier tab and allows the switching between channel lists.
OK	Closes the window.

12-2-2. Amplifier Settings Tab (In the case of analog amplifier)

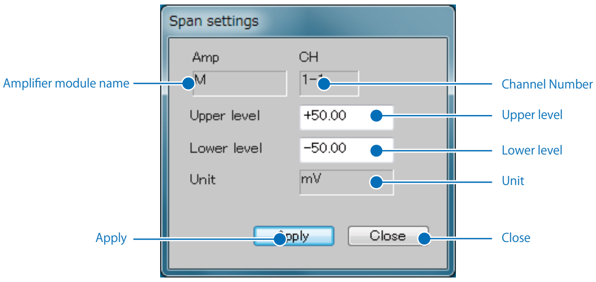
Set the analog tab when using analog module.


Amp settings
M
Main module
Amp settings
Trigger start
Trigger stop
Alarm settings
CH
Annotation
ALL
Input
Range
Filter
Span
Scaling
Auto zero settings
OK
Channel Number
Line Color
Annotation
Input
Range
Filter
Unit
Span
Scaling
Auto zero settings

Name	Explanation
Channel Number	Displays the input signal's module number and channel number. [Module Number]-[Channel Number]
Line Color	It is possible to set the waveform color.
Annotation	It is possible to input signal names to each channel. A maximum of 31 characters is allowed.
Input	To select input. There may be difference in the selection value depending on the type of machine or amplifier module. For more details, please refer to the main module's user's manual.
Range	To select the input range. There may be difference in the selection value depending on the type of machine or amplifier module. For more details, please refer to the main module's user's manual.
Filter	To select a filter There may be difference in the selection value depending on the type of machine or amplifier module. For more details, please refer to the main module's user's manual.
Unit	Displays the unit.
Span	To set the upper value and lower value of the signal displayed in the waveform window.
Scaling	Unit conversion. When the voltage input is set to 4-point, it is possible to set the temperature input as offset.
Auto zero settings	To adjust the current input value of each channel to the zero-point position.

12-2-2-1. Span Setting

To set the span. The setting is done by inputting numerical values.

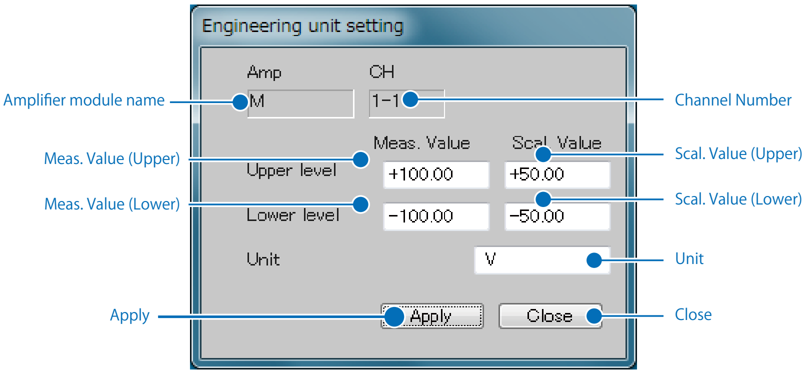

Span settings
Amp
CH
Apply
Close
Amplifier module name
Channel Number
Upper level
Lower level
Unit
Apply
Close

Amp: M
CH: 1-1
Upper level: +50.00
Lower level: -50.00
Unit: mV

Name	Explanation
Amplifier module name	Displays the names of all module amplifiers that are being configured.
Channel Number	Displays the input signal's module number and channel number. [Module Number]-[Channel Number]
Upper level	To input the span upper value. The largest value during voltage input is ±110% of the full scale (range). That temperature input is from +2000° C to -270° C (Celsius). That during humidity input is from +110% to -110%.
Lower level	Inputs span lower value. The largest value during voltage input is ±110% of the full scale (range). That temperature input is from +2000° C to -270° C (Celsius). That during humidity input is from +110% to -110%.
Unit	Displays the unit.
Settings	Transmits entered values to the main module.
Close	Closes the screen.

12-2-2-2. Scaling Setting

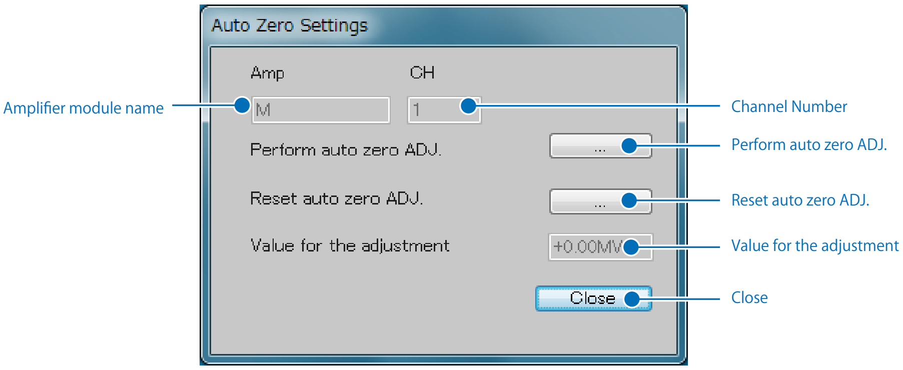
Changes the scaling setting. Setting is done by inputting the upper and lower values of both the input side and the conversion side. It is possible to set 2-point offset during temperature input.


Engineering unit setting
Amp
CH
Amplifier module name
M
1-1
Channel Number
Meas. Value
Scal. Value
Meas. Value (Upper)
Scal. Value (Upper)
Upper level
+100.00
+50.00
Meas. Value (Lower)
Scal. Value (Lower)
Lower level
-100.00
-50.00
Unit
V
Unit
Apply
Apply
Close
Close

Name	Explanation
Amplifier module name	Displays the names of all module amplifiers that are being configured.
Channel Number	Displays the input signal's module number and channel number. [Module Number]-[Channel Number]
Measured value (Upper/Lower)	To set the upper value/ lower value of the original value. There is not difference between the upper value/lower value during temperature input.
Scaling value (Upper/Lower)	To set the post-conversion upper value/lower value There is not difference between the upper value/lower value during temperature input.
Unit	To input the post-conversion unit. Can input up to a maximum of 8 characters.
Settings	Transmits entered values to the main module.
Close	Closes the screen.

12-2-2-3. Auto zero settings

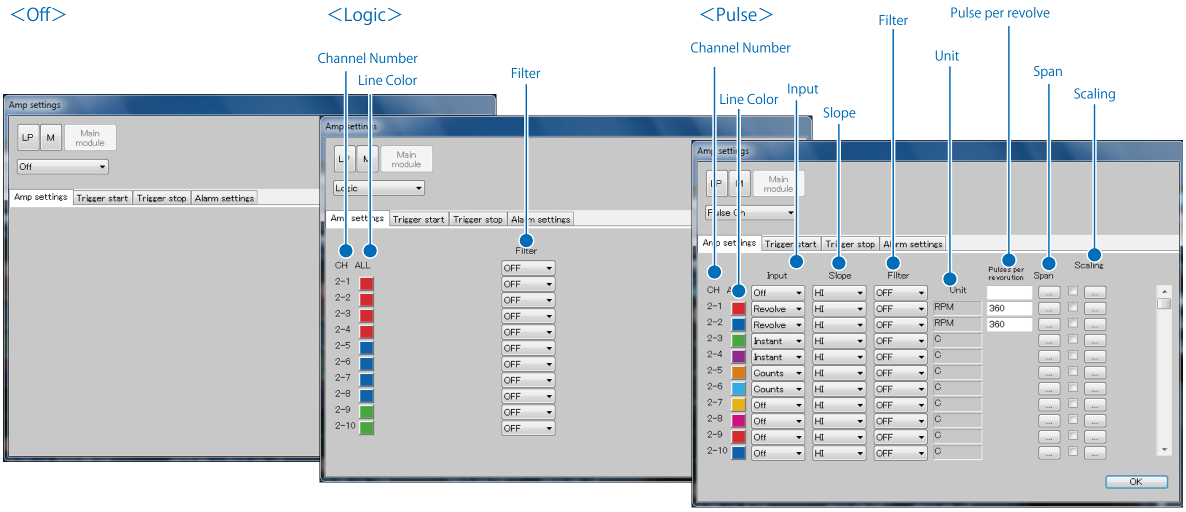
To adjust the current input value to zero-point. The automatic adjustment range is ±10% of the setting range. The automatic adjustment value is reset when the range of the channel is switched.


Auto Zero Settings
Amp
CH
Amplifier module name
M
1
Channel Number
Perform auto zero ADJ.
...
Perform auto zero ADJ.
Reset auto zero ADJ.
...
Reset auto zero ADJ.
Value for the adjustment
+0.00MV
Value for the adjustment
Close
Close

Name	Explanation
Amplifier module name	Displays the names of all module amplifiers that are being configured.
Channel Number	Displays the input signal's module number and channel number. [Module Number]-[Channel Number]
Perform auto zero adjustment	To perform zero-point automatic adjustment.
Reset auto zero adjustment	To delete the zero-point voltage value.
Value for the adjustment	Displays the adjusted voltage value.
Close	Closes the screen.

12–2–3. Amplifier Setting Tab (in the case of pulse logic amplifiers)

To set amplifier tab during logic pulse modules. The setting screen changes with the switch of logic/pulse.


＜Off＞
＜Logic＞
＜Pulse＞
Channel Number
Line Color
Filter
Channel Number
Line Color
Input
Slope
Filter
Unit
Pulse per revolve
Span
Scaling
Amp settings
LP
M
Main module
Off
Logic
Pulse Cn
Amp settings
Trigger start
Trigger stop
Alarm settings
CH
ALL
Filter
Input
Slope
Unit
Pulses per revolution
Span
Scaling
Revolve
Instant
Counts
HI
OFF
RPM
360
OK

12-2-3-1. When Off Setting

Logic pulse is set as Off. Nothing will be displayed.

12-2-3-2. When Logic Setting

The logic pulse setting is set to logic.

Name	Explanation
Channel Number	Displays the input signal's module number and channel number. [Module Number]-[Channel Number]
Line Color	It is possible to set the waveform color. Depending on the connected device, some devices might not save the waveform color to the main module. If this occurs, the waveform color will reverted to the default color.
Filter	To select a filter There may be difference in the selection value depending on the type of machine or amplifier module. For more details, please refer to the main module's user's manual.

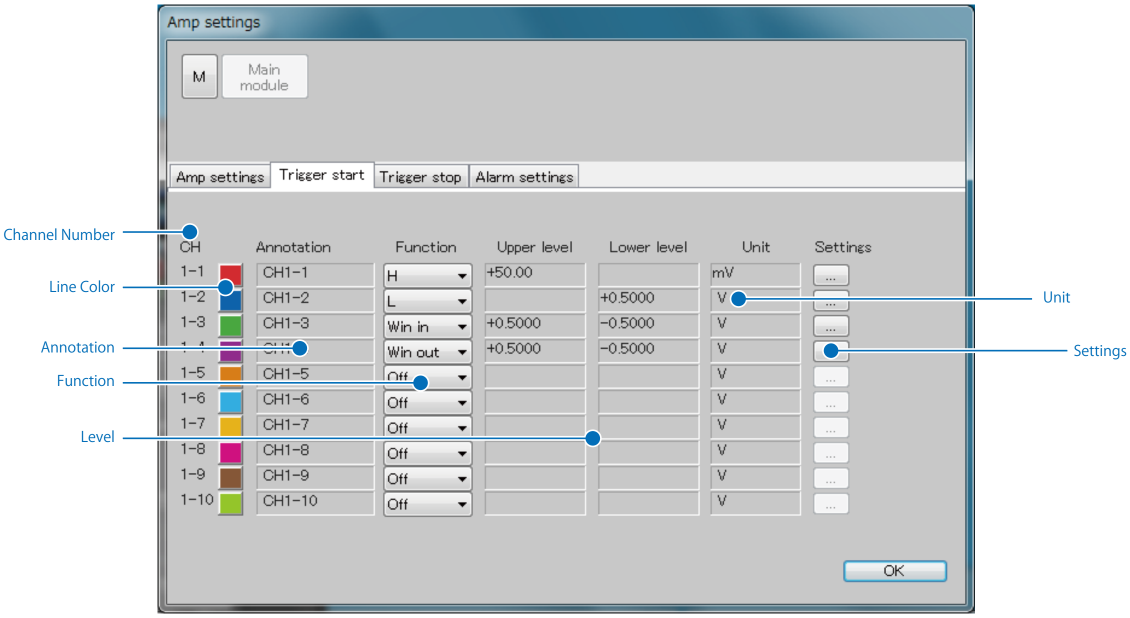
12-2-3-3. Pulse Setting

The Pulse Setting is automatically set to Logic Pulse defaults

<table>
<tr><th>Name</th><th colspan="2">Explanation</th></tr>
<tr><td>Channel Number</td><td colspan="2">Displays the input signal's module number and channel number. [Module Number]-[Channel Number]</td></tr>
<tr><td>Line Color</td><td colspan="2">It is possible to set the waveform color. Depending on the connected device, some devices might not save the waveform color to the main module. If this occurs, the waveform color will reverted to the default color.</td></tr>
<tr><td rowspan="3">Input</td><td>Revolve</td><td>Pulses generated per minute will be counted.</td></tr>
<tr><td>Counts</td><td>Will estimate and count the generation of internal sampling pulses.</td></tr>
<tr><td>Instant</td><td>Will count the generation of internal sampling pulses.</td></tr>
<tr><td rowspan="2">Slope</td><td>High</td><td>Tallies signal build–up.</td></tr>
<tr><td>Low</td><td>Tallies signal decay.</td></tr>
<tr><td>Filter</td><td colspan="2">Setting the pulse filter. The filter conforms approximately -3dB at 30Hz.</td></tr>
<tr><td>Unit</td><td colspan="2">Displays the unit.</td></tr>
<tr><td>Pulse per revolve.</td><td colspan="2">Sets the number of pulses in a single rotation. Available for input only when under "Number of Rotations".</td></tr>
<tr><td>Span</td><td colspan="2">Setting the pulse span. Please refer to the analog amplifier span.</td></tr>
<tr><td>Scaling</td><td colspan="2">Unit conversion. Please refer to the analog amplifier scaling.</td></tr>
</table>

12-2-4. Stop Trigger-start/stop Setting Tab

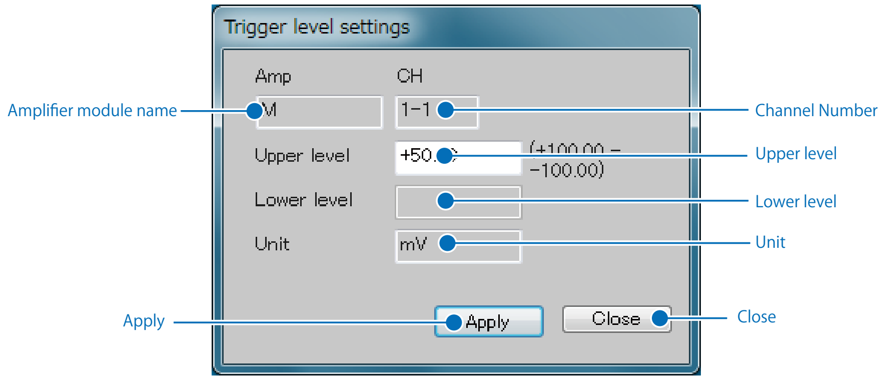
Setting the trigger level for each channel.


Amp settings
M
Main module
Amp settings
Trigger start
Trigger stop
Alarm settings
OK
Channel Number
Line Color
Annotation
Function
Level
Unit
Settings

CH		Annotation	Function	Upper level	Lower level	Unit	Settings
1-1	🟥	CH1-1	H	+50.00		mV	...
1-2	🟦	CH1-2	L		+0.5000	V	...
1-3	🟩	CH1-3	Win in	+0.5000	-0.5000	V	...
1-4	🟪	CH1-4	Win out	+0.5000	-0.5000	V	...
1-5	🟧	CH1-5	Off			V	...
1-6	🟦	CH1-6	Off			V	...
1-7	🟨	CH1-7	Off			V	...
1-8	🟪	CH1-8	Off			V	...
1-9	🟫	CH1-9	Off			V	...
1-10	🟩	CH1-10	Off			V	...

Name	Explanation
Channel Number	Displays the input signal's module number and channel number. [Module Number]-[Channel Number]
Line Color	Displays the waveform color for each channel.
Annotation	Displays the annotation for each channel.
Function	Off: Is invalid High: A trigger will activate in response to an input signal exceeding it's set level. Low: A trigger will activate in response to an input signal falling below it's set level. Window In: A trigger will activate in response to the input signal falling inside it's set level. Window Out: A trigger will activate in response to the input signal falling outside it's set level.
Display level value	Displaying the level setting.
Unit	Displays the unit.
Settings	Displays a screen for setting upper and lower limits.

12-2-4-1. Trigger-level Setting



Trigger level settings

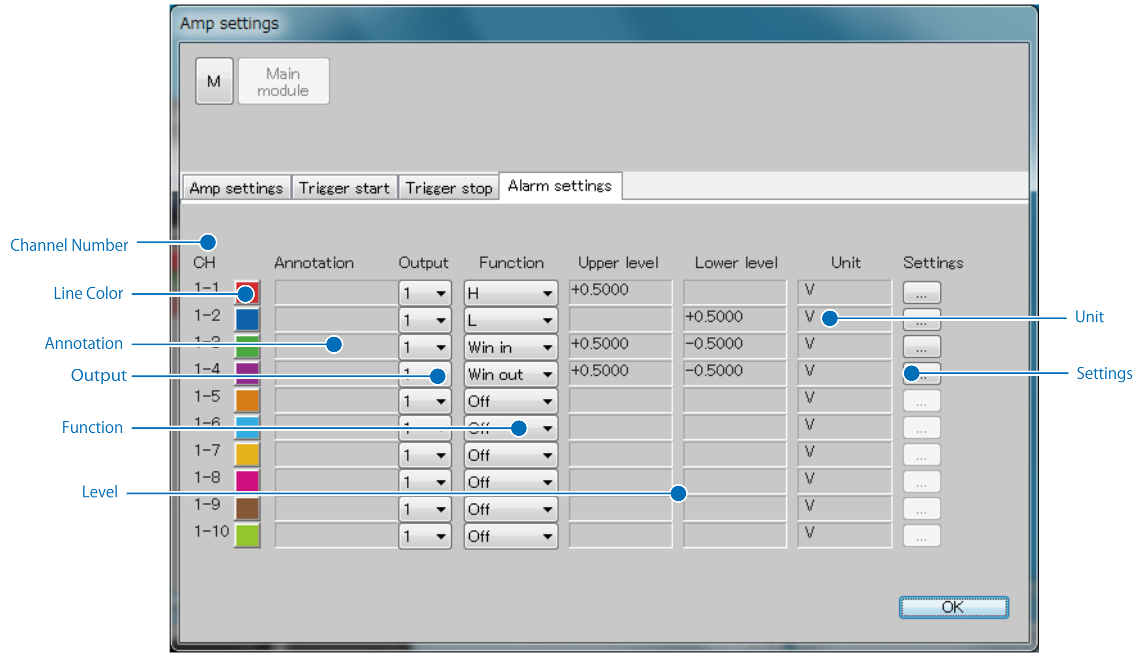
Amp: M
CH: 1-1
Upper level: +50. (+100.00 – −100.00)
Lower level:
Unit: mV

Apply
Close
Amplifier module name
Channel Number
Upper level
Lower level
Unit
Apply
Close

Name	Explanation
Amplifier module name	Displays the names of all module amplifiers that are being configured.
Channel Number	Displays the input signal's module number and channel number. [Module Number]-[Channel Number]
Upper level (input range)	Inputs during build-up setting, and Window In/Out setting. Displays the setting range of the input within the().
Lower level (input range)	Inputs during decay setting, and Window In/Out setting. Displays the setting range of the input within the().
Unit	Displays the unit.
Settings	Transmits entered values to the main module.
Close	Closes the screen.

12-2-5. Alarm Setting Tab

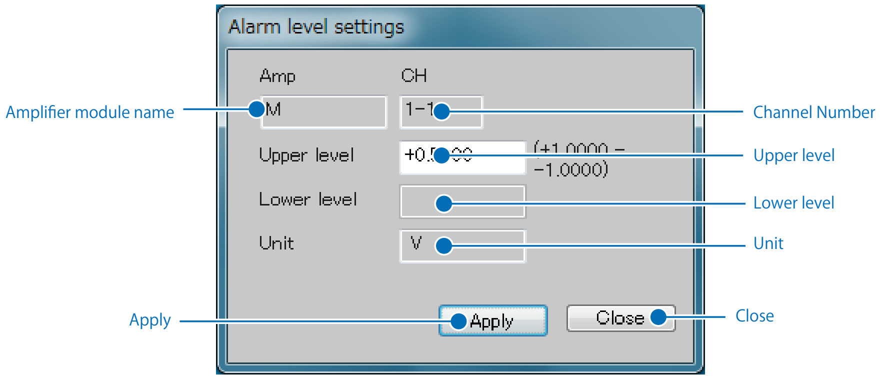
Setting the alarm level for each channel.


Amp settings
M
Main module
Amp settings
Trigger start
Trigger stop
Alarm settings
Channel Number
Line Color
Annotation
Output
Function
Level
Unit
Settings
OK

CH		Annotation	Output	Function	Upper level	Lower level	Unit	Settings
1-1	🟥		1	H	+0.5000		V	...
1-2	🟦		1	L		+0.5000	V	...
1-3	🟩		1	Win in	+0.5000	-0.5000	V	...
1-4	🟪		1	Win out	+0.5000	-0.5000	V	...
1-5	🟧		1	Off			V	...
1-6	🟦		1	Off			V	...
1-7	🟨		1	Off			V	...
1-8	🟪		1	Off			V	...
1-9	🟫		1	Off			V	...
1-10	🟩		1	Off			V	...

<table>
<tr><th>Name</th><th>Explanation</th></tr>
<tr><td>Channel Number</td><td>Displays the input signal's module number and channel number. [Module Number]-[Channel Number]</td></tr>
<tr><td>Line Color</td><td>Displays the waveform color for each channel.</td></tr>
<tr><td>Annotation</td><td>Displays the annotation for each channel.</td></tr>
<tr><td>Output</td><td>Displays the alarm module's output channel. If multiple channels are set to the same number, the unit will output as <1> or <2></td></tr>
<tr><td>Function</td><td>Comparative mode will be set to each channel's alarm level. Sets combinations for conditional level triggers for each channel.
<table>
<tr><td>Off</td><td>Alarm is not set to channel.</td></tr>
<tr><td>High</td><td>An alarm will activate in response to the set input signal exceeding its level.</td></tr>
<tr><td>Low</td><td>An alarm will activate in response to the set input signal falling below its level.</td></tr>
<tr><td>Window In</td><td>An alarm will activate in response to the set input signal internalizing.</td></tr>
<tr><td>Window Out</td><td>An alarm will activate in response to an input signal that goes outside its set level.</td></tr>
</table></td></tr>
<tr><td>Display level value</td><td>Displaying the level setting.</td></tr>
<tr><td>Unit</td><td>Displays the unit.</td></tr>
<tr><td>Settings</td><td>Displays the screen for setting the upper and lower alarm level limits.</td></tr>
</table>

12-2-5-1. Alarm Level Settings


Alarm level settings
Amplifier module name
Channel Number
Upper level
Lower level
Unit
Apply
Close
Apply
Close

Amp: M

CH: 1-1

Upper level: +0.5000 (+1.0000 – −1.0000)

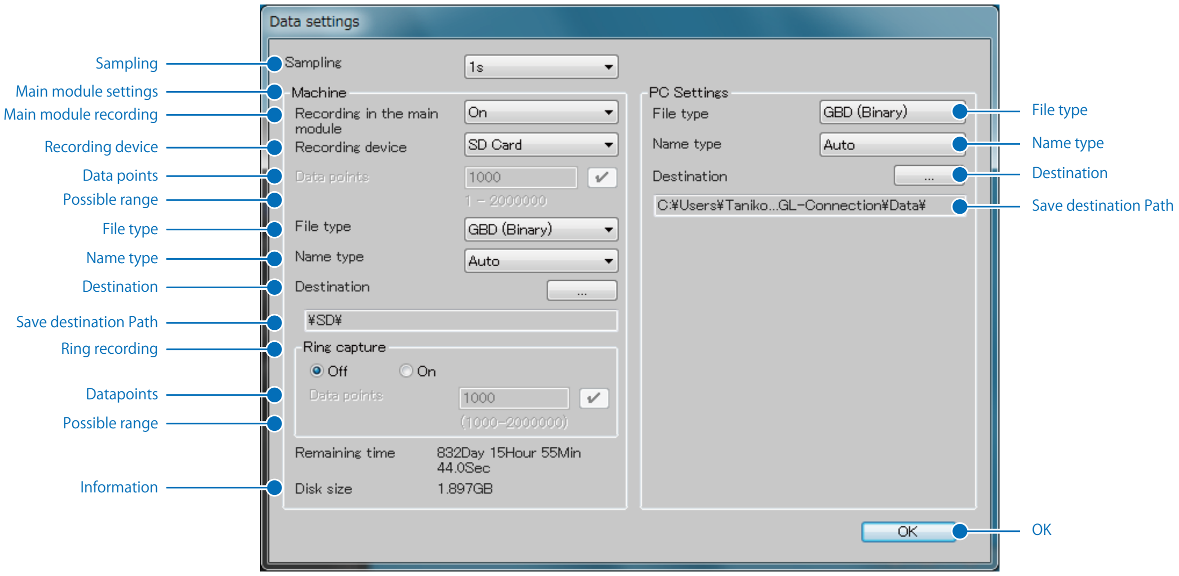
Lower level:

Unit: V

Name	Explanation
Amplifier module name	Displays the names of all module amplifiers that are being configured.
Channel Number	Displays the input signal's module number and channel number. [Module Number]-[Channel Number]
Upper level (input range)	Inputs during rise setting, and Window In/Out setting. Displays the setting range of the input within the ().
Lower level (input range)	Inputs during fall setting, and Window In/Out setting. Displays the setting range of the input within the ().
Unit	Displays the unit.
Settings	Transmits entered values to the main module.
Close	Closes the screen.

12-3. Data Settings

Sets the sampling, main module recording destination, and method of data recording on the PC.


Sampling
Main module settings
Main module recording
Recording device
Data points
Possible range
File type
Name type
Destination
Save destination Path
Ring recording
Datapoints
Possible range
Information
File type
Name type
Destination
Save destination Path
OK
OK
...

Data settings

Sampling: 1s

Machine
Recording in the main module: On
Recording device: SD Card
Data points: 1000
1 – 2000000
File type: GBD (Binary)
Name type: Auto
Destination
¥SD¥
Ring capture
● Off ○ On
Data points: 1000
(1000–2000000)
Remaining time: 832Day 15Hour 55Min 44.0Sec
Disk size: 1.897GB

PC Settings
File type: GBD (Binary)
Name type: Auto
Destination
C:¥Users¥Taniko...GL-Connection¥Data¥

<table>
<tr><th>Name</th><th>Explanation</th></tr>
<tr><td>Sampling</td><td>Sets the data recording intervals. The sampling intervals and connected amplifiers will adjust depending on the number of channel settings and the save-destination of the recording medium. For information, refer to “12-3-1. Sampling limits”. Also, transfers may be incomplete when exceeding sampling limits due to network delays, etc. When recording to PC by connecting to a device in real-time, please confirm the discarded data count under Recording Information Window during free-running mode. When the discarded data is counted, the data is discarded due to incomplete data transfer. If this occurs, please reset the sampling rate to a lower speed.</td></tr>
<tr><td>Main module settings</td><td>Sets the option to record the data to the connecting main module.</td></tr>
<tr><td>Main module recording</td><td><table><tr><td>On</td><td>Saves data to the connecting main module.</td></tr><tr><td>Off</td><td>Data is not saved.</td></tr></table></td></tr>
<tr><td>Recording devices</td><td>Sets the recording destination.<table><tr><td>Built-in RAM</td><td>Saves to Build-in RAM. Data saved to the Built-in RAM will be erased when power to the GL main module is lost. Please set Built-in RAM when doing high speed recording under 1ms (fastest sampling speed conforms to module). The PC cannot record real-time data during Built-in RAM setting.</td></tr><tr><td>Built-in flash</td><td>Records onto Built-in drive. Records sampling slower that 1ms.</td></tr><tr><td>SD card</td><td>Records to the external SD card. We ask all our customers to please have your SD card ready.</td></tr><tr><td>SSD module</td><td>Records to the SSD module (64GB) (Option) The PC cannot record real-time data during SSD module recording.</td></tr></table></td></tr>
<tr><td>Data points</td><td>Sets the recording data points during Built-in RAM setting.</td></tr>
<tr><td>Possible range</td><td>Displays the recording data points range of the Built-in RAM.</td></tr>
</table>

<table>
<tr><td>File type</td><td>Sets the format of recorded data.<table><tr><td>GBD（binary）</td><td>Records as our unique binary data. Data can be played back at high speed because the recording size is comparatively smaller than CSV.</td></tr><tr><td>CSV（Text）</td><td>Records as text format that can be displayed by Excel, etc. Compared to GBD, the data size is larger and data playback cannot be displayed at high speed.</td></tr></table></td></tr>
<tr><td>Name type</td><td>Sets how to name files.<table><tr><td>Automatic</td><td>Creates dated folders in the designated folder and creates files.（Example: No1_2012-04-04_12-34-56.GBD）</td></tr><tr><td>Unspecified</td><td>Sets the name of unspecified folders.</td></tr></table></td></tr>
<tr><td>Recording destination</td><td>Sets the save-destination of the data recorded to the main module.</td></tr>
<tr><td>Save destination path</td><td>Displays the saving destination path.</td></tr>
<tr><td>Ring recording</td><td>Ring recording function records while simultaneously erasing the old data, once the set recording marks are exceeded. For more details, please refer to the main module's user's manual.</td></tr>
<tr><td>Data points</td><td>Sets recording data points during ring recording. For more details, please refer to the main module's user's manual.</td></tr>
<tr><td>Possible range</td><td>Displays the setting range of the ring recording data points.</td></tr>
<tr><td>Recording Information</td><td>Displays the possible recording time and total remaining disk space at the recording destination.</td></tr>
<tr><td>PC file type</td><td>Sets the PC file format.
Please refer to the file format of the main module.</td></tr>
<tr><td>PC name type</td><td>Sets how to name files.<table><tr><td>Automatic</td><td>Creates dated folders in the designated folder and creates files.（Example: No1_2012-04-04_12-34-56.GBD）</td></tr><tr><td>Unspecified</td><td>Sets the name of unspecified folders.</td></tr></table></td></tr>
<tr><td>PC recording destination</td><td>Sets the save-destination of the data recorded to the PC.</td></tr>
<tr><td>PC save destination path</td><td>Displays the saving destination pass.</td></tr>
<tr><td>OK</td><td>Closes the screen.</td></tr>
</table>

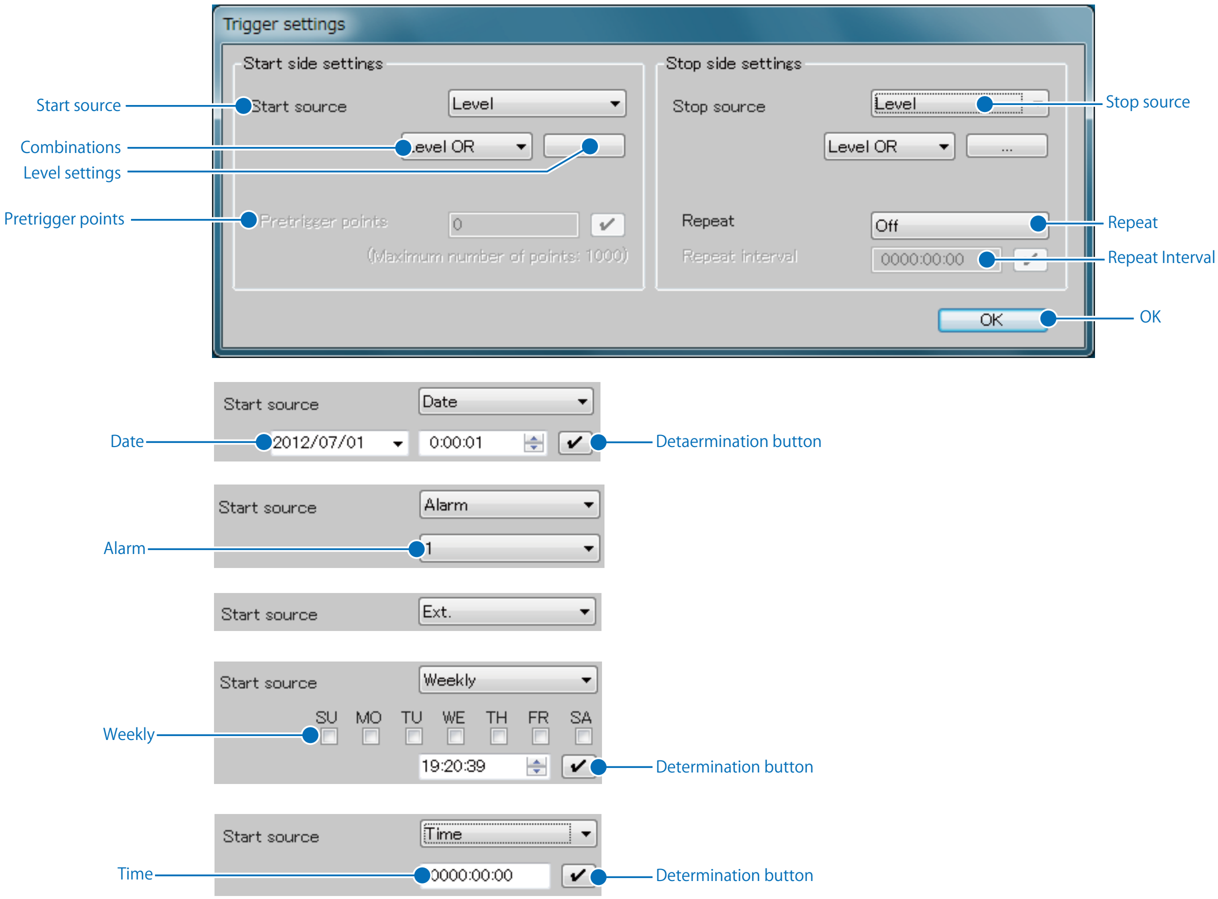
12-3-1. Sampling Limits

High speed sampling is limited by the number of recording channels, connected modules, and the recording destination, etc. Even within the following limits, transmission may be incomplete due to transmission delays with multiple module connections, especially with LAN connections. If this occurs, please reduce the sampling rate. For more details on the GL device limits, please refer to the main module user's manual on CD-ROM.

<table>
<tr><th>Name</th><th>Explanation</th></tr>
<tr><td>module-based limits
(GL device limits)</td><td><table>
<tr><td>Voltage module</td><td>1ms</td></tr>
<tr><td>Voltage / Temperatuer module</td><td>10ms</td></tr>
<tr><td>High Speed Voltage module</td><td>1us</td></tr>
<tr><td>Logic / Pulse module</td><td>Logic: 1us/ Pulse: 100us</td></tr>
</table></td></tr>
<tr><td>Recording destination-based limits
(GL device limits)</td><td><table>
<tr><td>Built-in RAM</td><td>1us</td></tr>
<tr><td>Built-in flash</td><td>1ms</td></tr>
<tr><td>SD card</td><td>1ms</td></tr>
<tr><td>SSD module</td><td>1 to 2 modules:1us; however, the pulse runs only until 8ch
3 to 4 modules: 2us; however, the pulse is only until 16ch
Over 5 modules: 5us</td></tr>
</table></td></tr>
<tr><td>Main module recording format-based limits
(GL device limits)</td><td><table>
<tr><td>GBD (binary)</td><td>1us</td></tr>
<tr><td>CSV (Text)</td><td>10ms</td></tr>
</table></td></tr>
<tr><td>Repeat recording-based limit.
(GL device limits)</td><td>Repeat recording-based limit. (GL device main module limits)
When repeat recording is on:100ms (Only when Built-in Flash, SD card, SSD module)</td></tr>
<tr><td>Calculation function-based limits
(GL device limits)</td><td>100ms
*The GL device's calculation function cannot be used with this application. There is no calculation function in this application.</td></tr>
<tr><td>Transmission-based limits
(Application limits)</td><td>The PC's recorded sampling capacity is limited based on transmission volume limits.
*Even within the following limits, there are occasions when transmission will be incomplete when connecting LAN to the existing network. If this occurs, please slow the sampling setting.<table>
<tr><td rowspan="2">USB connection</td><td>GBD (binary) format</td><td>1ms/1Module (*)</td></tr>
<tr><td>CSV (text) format</td><td>1ms/1ch (*)</td></tr>
<tr><td rowspan="2">LAN connection</td><td>GBD (binary) format</td><td>10ms/1Module (*)</td></tr>
<tr><td>CSV (text) format</td><td>10ms/1Module (*)</td></tr>
</table>*The number of channels includes channels that are off. The HSV amplifier is treated as 10ch
Example1) when using a USB connection, recording destination built-in flash, GBD recording, an analog 5 modules 50ch recording to PC: Fastest 5ms sampling.
Example2)when there are two GL devices (analog 3 modules amplifier, analog 4 modules amplifier), recording GBD recording to PC, using LAN connection (total 70ch): Fastest 100ms sampling.</td></tr>
</table>

12-4. Trigger Settings

Sets conditional trigger for the start and stop of recording.



Trigger settings

Start side settings

Start source: Level

Level OR

Pretrigger points: 0

(Maximum number of points: 1000)

Stop side settings

Stop source: Level

Level OR

Repeat: Off

Repeat interval: 0000:00:00

Start source: Date

2012/07/01 0:00:01

Start source: Alarm

1

Start source: Ext.

Start source: Weekly

SU MO TU WE TH FR SA

19:20:39

Start source: Time

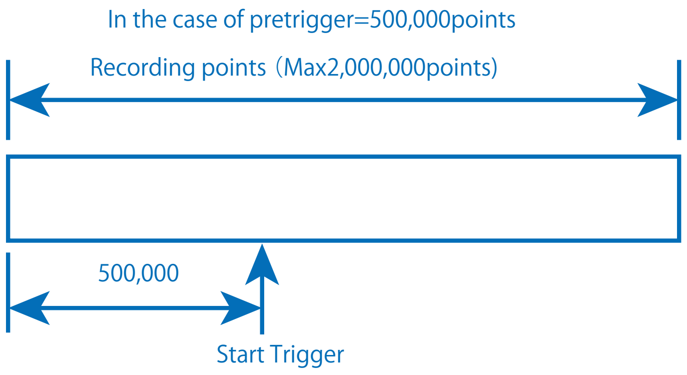
0000:00:00

Start source
Combinations
Level settings
Pretrigger points
Stop source
Repeat
Repeat Interval
OK
...
✔
Date
Detaermination button
Alarm
Weekly
☐ ☐ ☐ ☐ ☐ ☐ ☐
Determination button
Time
Determination button

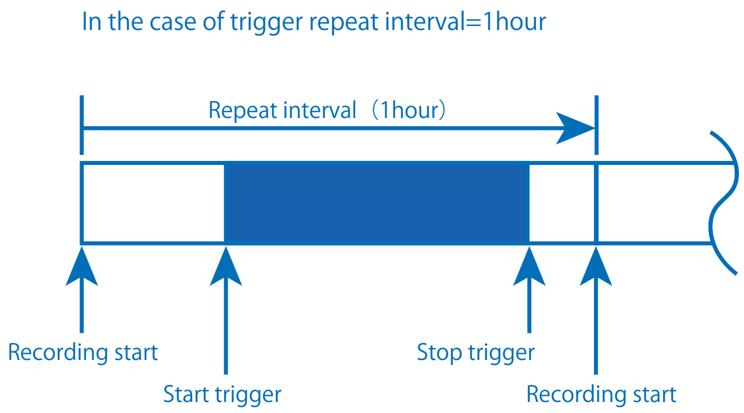
Name	Explanation	
start/stop source	Sets conditions for the start and stop of measuring.	
	Off	Starts unconditional recording. (There are no stopping conditions)
	Level	Starts (or stops) recording the designated channel's input signal once the set level's conditions are met.
	Alarm	Recording starts (or stops) once the designated alarm goes off.
	Date	Recording starts (or stops) once the designated date and time is reached. Active when repeat recording is off.
	Date (Daily)	Recording starts (or stops) once the designated date and time is reached. Active when repeat recording is on.
	External input	Recording starts (or stops) with the external terminal signal. There are approximately 2 external drive signals. Recording starts (or stops) when a fall under 5V is detected. Both start/stop cannot be externalized when sampling is externalized.
	Weekly	Recording starts (or stops) on the set time and day.
	Time	Recording starts (or stops) when the specified time has lapsed.

Combinations		Sets combinations for conditional level triggers for each channel. For more details, please refer to Main module's user's manual on CD-ROM.
	Level	Requirements determine operation level.
	Edge	Requirements determine operation edge.
	OR	Recording starts (or stops) as long as at least one of the set level requirements is satisfied.
	AND	Recording starts (or stops) when all the set level requirements are satisfied.
Level settings		Sets the level's determined requirements once the start/stop trigger's conditions are "leveled".
Alarm settings		Sets the start/stop requirements for the target alarm number once the alarm is set. Possible settings for alarm numbers may differ depending on the device.
Date Setting		Determines the start/stop requirements for the date once the "set date" is set.
Date and Time		Configures with each trigger.
	Date requirements	Used to to set the date and time.
	Time requirements	Used to to set the time.
	Weekly requirements	Used to to set the time and day.
Pre-trigger points		Sets data points for recording before a trigger is generated. The pre-trigger function can only set the recording destination to the built-in RAM when the start source setting is off.
Repeat recording		Starts repeat recording once a trigger stop is generated.
Repeat interval		Sets time intervals between the time recording begins and the next repeat recording starts. Once a trigger stop is generated, instant repeat recording begins once the time of the existing repeat interval passes.
OK		Closes the screen.

12-4-1-1. Pre-trigger Operation

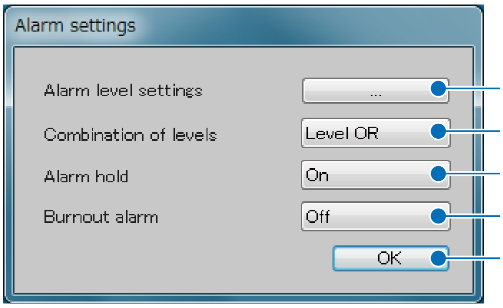

In the case of pretrigger=500,000points
Recording points（Max2,000,000points)
500,000
Start Trigger

12-4-1-2. Operation of Repeat Intervals


In the case of trigger repeat interval=1hour
Repeat interval（1hour）
Recording start
Start trigger
Stop trigger
Recording start

12-5. Alarm Settings

Configures alarm settings.



Alarm settings

Alarm level settings ...

Combination of levels Level OR

Alarm hold On

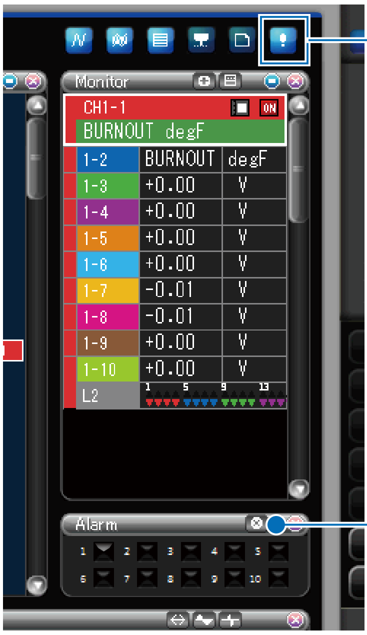
Burnout alarm Off

OK
Alarm level settings
Combinations
Alarm hold
Burnout alarm
OK

<table>
<tr><th>Name</th><th>Explanation</th></tr>
<tr><td>Alarm level settings</td><td>Sets requirements for alarm generation.</td></tr>
<tr><td>Combinations</td><td>Sets combination for alarm requirements for each channel.
<table>
<tr><td>Level</td><td>Requirements determine operation level.</td></tr>
<tr><td>Edge</td><td>Requirements determine operation edge.</td></tr>
<tr><td>OR</td><td>Recording starts (or stops) as long as at least one of the set level requirements is satisfied.</td></tr>
<tr><td>AND</td><td>Recording starts (or stops) when all the set level requirements are satisfied.</td></tr>
</table>
Though alarm hold was set as Off when combination was edge OR/AND, as for the channel generated once, alarm continues holding alarm.</td></tr>
<tr><td>Alarm hold</td><td>Sets whether or not to clear of preserve a generated alarm status.
<table>
<tr><td>On</td><td>Preserves alarm generation. Click "clear alarm" on the alarm window to clear all channels of alarms.</td></tr>
<tr><td>Off</td><td>Does no preserve alarm generation. Restores alarm status and output for each CH once the alarm status is released.</td></tr>
</table></td></tr>
<tr><td>Burn-out alarm</td><td>Once this is set to On, an alarm will be generated in response to thermocouple connection temperature measurements registering burn out.</td></tr>
</table>

12-5-1. Alarm Clear Button

Alarm Clear is only available during free-running or recording when alarm hold is On.

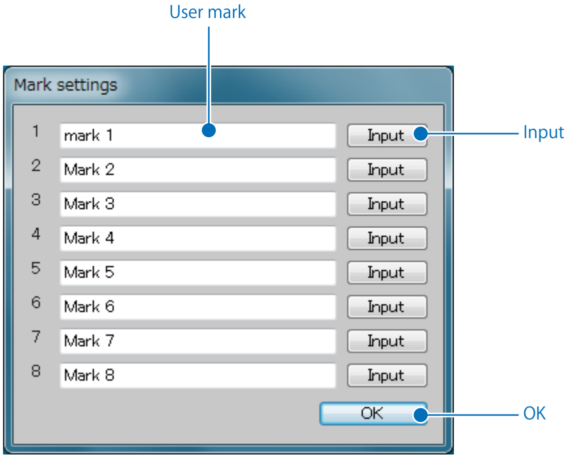


```
CH1-1                ON
BURNOUT  degF
1-2   BURNOUT  degF
1-3   +0.00    V
1-4   +0.00    V
1-5   +0.00    V
1-6   +0.00    V
1-7   -0.01    V
1-8   -0.01    V
1-9   +0.00    V
1-10  +0.00    V
L2
```

Monitor
1 5 9 13
Alarm
1 2 3 4 5
6 7 8 9 10
Sub-window button
Alarm window
Alarm clear button

12-6. Marker Settings

This function inputs a mark to the unspecified position above the waveform during data recording. The inputted mark can perform searches and confirmations during playback. The inserted characters are configured here.
By setting the characters before recording, you can insert other marks quickly and easily while recording (character marks can also be set during recording). While recording, insert mark from the “11-11-5-2. Mark insertion” under action on the control panel.



User mark

Input

OK

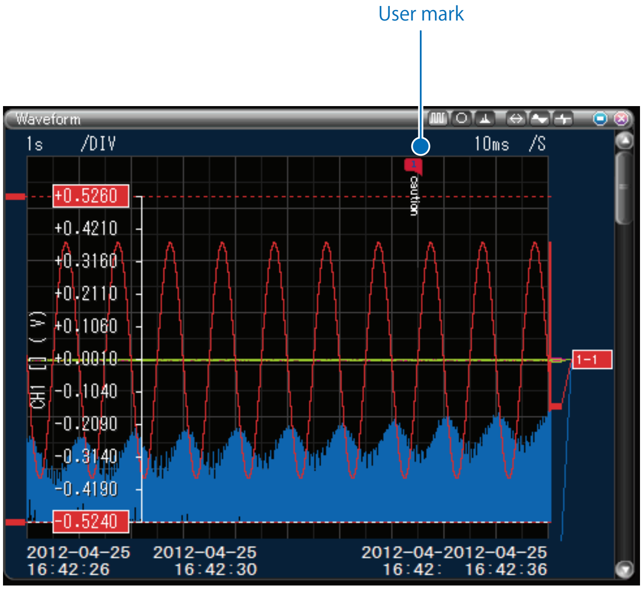
Mark settings

1 mark 1
2 Mark 2
3 Mark 3
4 Mark 4
5 Mark 5
6 Mark 6
7 Mark 7
8 Mark 8

Name	Explanation
User mark	You can insert 1-8 unspecified characters. You can insert up to 30 characters. Marks inserted during recording will be saved; however, only the characters inserted last will be effective.
Input	Clicking the input button shows the location update on the upper-right hand side above the waveform where a user mark was inserted. The mark will show the inserted position during data playback.
OK	Clicking OK closes the screen. This transmits the user mark character information to the GL main module.

12–6–1. Display user mark during recording

Insert mark from the "insert mark" under the action panel in the control panel.

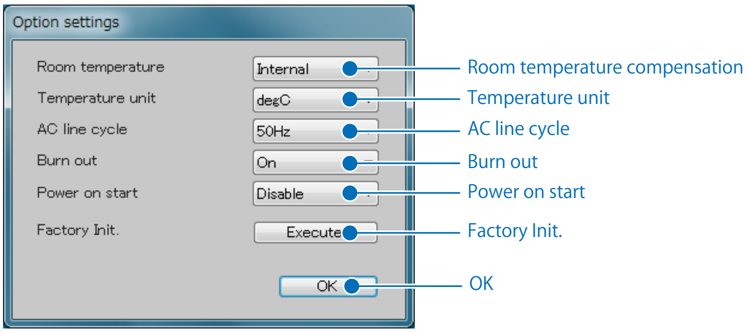


User mark

Waveform
1s /DIV
10ms /S
caution
+0.5260
+0.4210
+0.3160
+0.2110
+0.1060
+0.0010
-0.1040
-0.2090
-0.3140
-0.4190
-0.5240
CH1 [] (V)
1-1
2012-04-25 16:42:26
2012-04-25 16:42:30
2012-04-2012-04-25 16:42: 16:42:36

12-7. Option Settings

Perform option settings.



Option settings

Room temperature Internal

Temperature unit degC

AC line cycle 50Hz

Burn out On

Power on start Disable

Factory Init. Execute

OK

Name	Explanation
Room temperature compensation	Sets room temperature compensation in response to thermocouple temperature measurements. Sets internal temperature when the performs room temperature compensation. (Set interior to default) *Only effective with voltage/temperature modules.
Temperature unit	Unit of temperature for the temperature display can be changed between degrees of Celsius (° C) or Fahrenheit (° F) Only effective with *voltage/temperature modules.
AC line cycle	Please set the power to the main module to the local area frequency. (50Hz or 60Hz) This effects denoising, so please set it correctly. For more details, please refer to the main module user's manual. *Only effective with voltage/temperature modules.
Burn-out	Will carry out regular checks on the thermocouple connection break when set to On. Please use the thermocouple in OFF mode when other measuring devices are connected parallel to it, as it may effect other devices. A BURN OUT message will be displayed when a connection break is detected. *Only effective with voltage/temperature modules.
Power On start	Recording starts once power is applied to the main module. This setting operates only on the main module. Please set default to inactive.
Factory Initialization	The main module is set to factory settings. Initialization may occasionally take time. Please wait a little while.

12-8. Excel Settings

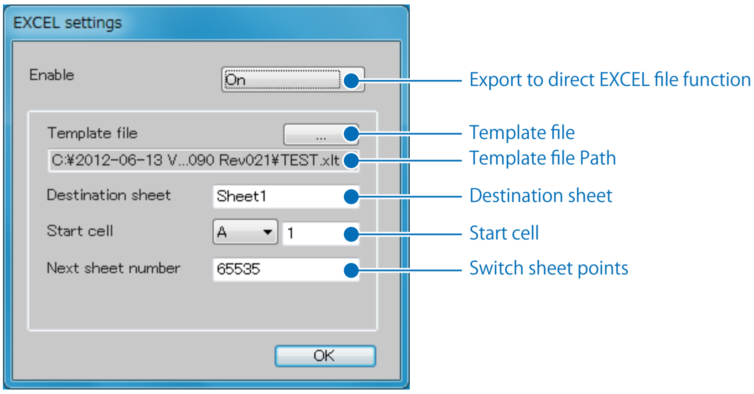
This function transmits data currently being recorded to Excel in real-time. Can be used to create original template files and reports, etc.

*Direct Excel functions cannot be used when the main module recording destination is the Built-in RAM, or SSD module (option).

* Microsoft Excel is required for the use of main module.

* Transfers to the graph cannot exceed 32000 lines.

* Transfers to Excel may occasionally be incomplete depending on sampling and the number of channels. If this occurs, please slow down sampling.



EXCEL settings

Enable: On

Template file

C:¥2012-06-13 V...090 Rev021¥TEST.xlt

Destination sheet: Sheet1

Start cell: A 1

Next sheet number: 65535

Export to direct EXCEL file function

Template file

Template file Path

Destination sheet

Start cell

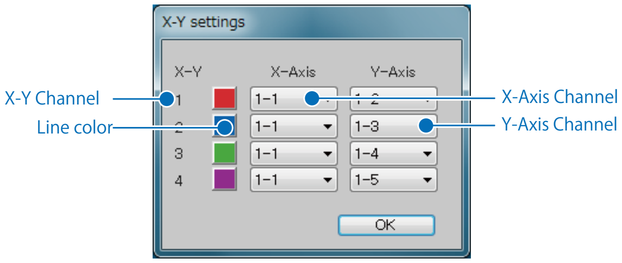
Switch sheet points

Name	Explanation
Direct Excel functions	Sets direct Excel functions to On or Off.
Template files	Performs direct Excel transfer destination template settings. This can be used for "xlt "or "xltx"file types. Standard templates are available under the "Temp" folder under the main software's installed folder.
Template file path	Displays the template path.
Transfer destination sheet	Sets the sheet name for the designated template folder.
Start cell	Sets the start cell the data will be transfered to.
Switch sheet points	Transmits data to a differ sheet when it reaches a set points. * Graph may occasionally not operate correctly when transferred to a different sheet. * Can display up to 65536 lines on versions earlier than Excel 2007. * Can display up to 1048576 line on versions later than Excel 2007. * Cannot transmit more than 32000 points using graphing to a template.

12-9. X-Y Settings

This waveform display can show the correlating waveform after assigning the respective analog input channel to the X and Y axis. There are a maximum of 4 X-Y channels available that can be assigned respective unspecified analog channels. Furthermore, it can also perform span and position controls, etc. (* Does not support pulse input)

* Ver1.00 does not support X-Y display during playback. Support in upgraded versions is under development.



X-Y		X-Axis	Y-Axis
1	🟥	1-1	1-2
2	🟦	1-1	1-3
3	🟩	1-1	1-4
4	🟪	1-1	1-5

Name	Explanation
X-Y channel	Displays the X-Y channel number.
Line Color	Displays the X-Y waveform color.
X axis channel	Displays the analog channel assigned to the X axis.
Y axis channel	Displays the analog channel assigned to the Y axis.

12-10. Mail Settings

You can send emails when an alarm is generated.

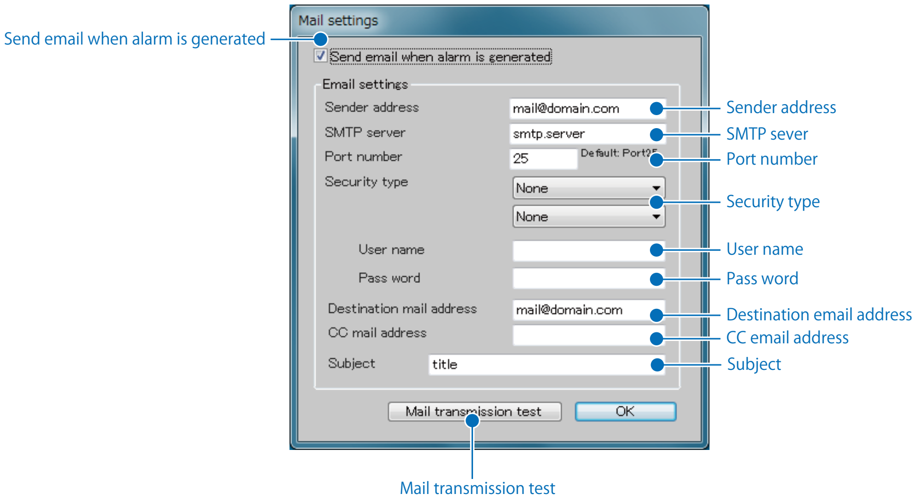
* This requires an environment capable of sending emails.

* Emails may not be sent depending on the sending email server's security system.

* Email transmission function effective only during recording.

* Emails cannot be transmitted during free-running even if an alarm is generated.

* Because the system does not transmit large volumes of email, no further emails can be sent for 1 minute after an email is sent. Alarms generated during periods where email is not being sent will send them based on the timing of the next transmission.



Mail settings

☑ Send email when alarm is generated

Email settings

Sender address: mail@domain.com

SMTP server: smtp.server

Port number: 25 Default: Port25

Security type: None / None

User name:

Pass word:

Destination mail address: mail@domain.com

CC mail address:

Subject: title

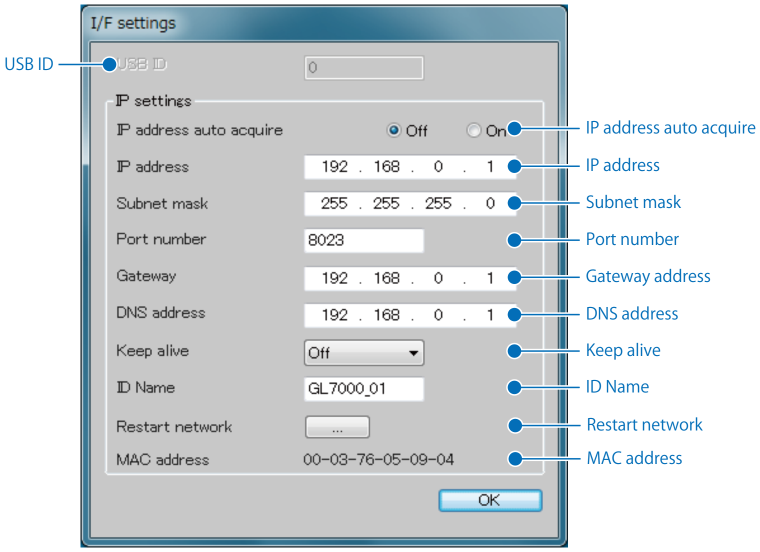
<table>
<tr><th>Name</th><th>Explanation</th></tr>
<tr><td>Send email
when alarm is generated</td><td>Checking off " レ "mark generates an alarm during recording, which then sends emails to the set email address.</td></tr>
<tr><td>Sender's email address</td><td>Sets the sender's email address.</td></tr>
<tr><td>Transmitting email server</td><td>Sets the transmitting email server (SMTP).</td></tr>
<tr><td>Port number</td><td>Sets the port number. The port number settings may differ depending on the security type.</td></tr>
<tr><td>Security type</td><td>Sets security settings as needed depending on the transmitting email server. For security settings, please confirm the email server transmission.
<table>
<tr><td>None</td><td>There is no security.</td></tr>
<tr><td>Plain-text passwords</td><td>Security is not tight with plain-text password and they flow through the network.</td></tr>
<tr><td>CRAM-MD5</td><td>Plain-text passwords that are not shared throughout the network are the safest ones.</td></tr>
</table>
Encryption settings
<table>
<tr><td>None</td><td>Will not encrypt.</td></tr>
<tr><td>SSL</td><td>Emails are encrypted both sending and receiving.</td></tr>
</table>
</td></tr>
<tr><td>User name</td><td>Sets security authentication when required.</td></tr>
<tr><td>Passwords</td><td>Sets security authentication when required.</td></tr>
<tr><td>Destination email address</td><td>Sets the transmission destination for emails.</td></tr>
<tr><td>CC email addresses</td><td>Sets the transmission destination for CC emails.</td></tr>
<tr><td>Subject</td><td>Sets the email subject.</td></tr>
<tr><td>Mail transmission test</td><td>Performs a test transmission</td></tr>
</table>

12-11. I/F Setting

Configure USB and LAN setting.

* When connected via USB, only IP can be set.

* When connected via LAN, only USB ID can be set.



I/F settings

USB ID: 0

IP settings

IP address auto acquire: ● Off ○ On

IP address: 192 . 168 . 0 . 1

Subnet mask: 255 . 255 . 255 . 0

Port number: 8023

Gateway: 192 . 168 . 0 . 1

DNS address: 192 . 168 . 0 . 1

Keep alive: Off

ID Name: GL7000_01

Restart network: ...

MAC address: 00-03-76-05-09-04

USB ID
IP address auto acquire
IP address
Subnet mask
Port number
Gateway address
DNS address
Keep alive
ID Name
Restart network
MAC address
OK

Name	Explanation
USB ID	Sets USB ID number. Please make sure not to copy USB ID when connecting a single PC to multiple devices via USB.
Automatic IP acquisition	Set automatic IP acquisition. A server that is able to assign functions to the connecting network is required.
IP address	Sets the IP address.
Subnet Mask	Sets the subnet mask.
Port number	Sets the port number.
Gateway address	Sets the Gateway address.
DNS address	Sets the DNS address.
Keep alive	When set to anything other than Off, the socket connection will be severed automatically if a period of non-transmission time is detected.
ID Name	Set the device's identifier.
Relaunching the Network	Applies IP settings. The connection will be forcibly severed during set-up. It may occasionally take about 1 minute to apply the settings.
MAC address	Displays the MAC set to the device.

13. Other functions

Introduction to other useful functions.

13-1. Group functions

Many different waveform display methods are possible using group and screen section functions. Group function creates copies of basic display tabs. It is possible to analyze signals by setting up original tabs and copied abs independently. It is possible to perform different Time/DIV settings, span and stretch settings, Y-T waveform, and X-Y waveforms, etc.

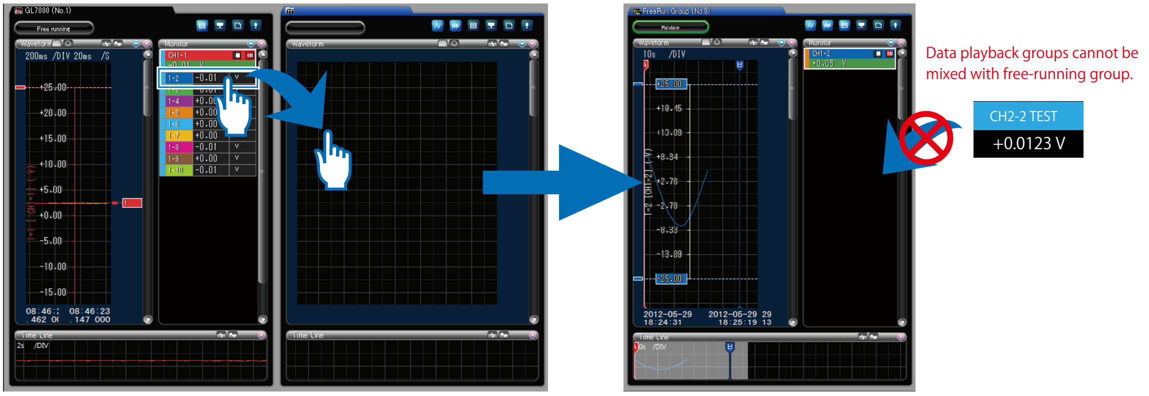
13-1-1. Types of group functions

Name	Explanation
Empty (Free) group	Free group tab. Groups are determined when channels from the free-run/recording tabs or playback tabs are added to groups.
Free running/Recording In Progress group	Data can be grouped by the free-running or recording tab. It is possible to mix identical families of data. Data cannot be mixed if it is under the data playback tab.
Data playback group	This group plays back data. It is possible to mix data from PC playback and the main module playback tab. Data cannot be mixed if it is under the data playback tab.

13-1-1-1. Determination of the data playback group and free-running /recording group from the open group

Drop the free-running tab channel into the empty group.

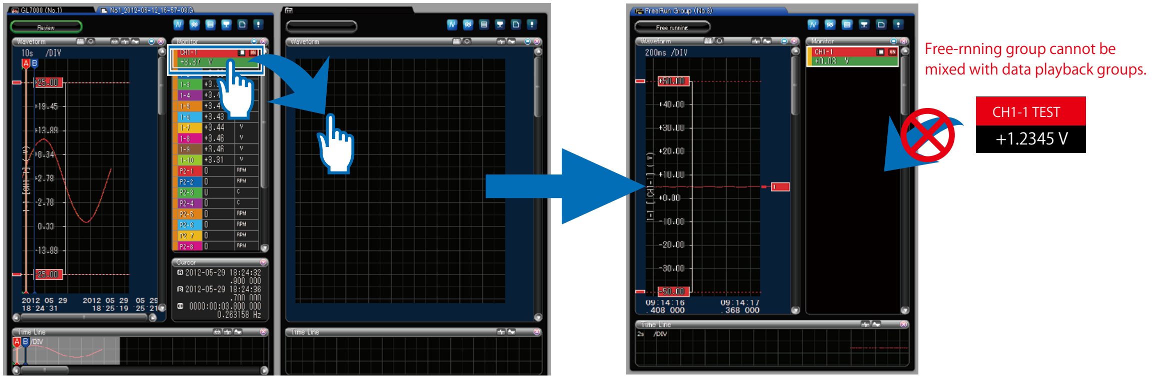
Set as free-running group.



Data playback groups cannot be mixed with free-running group.

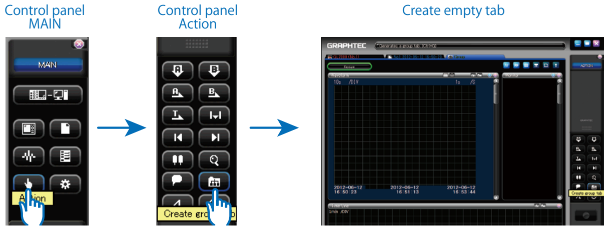
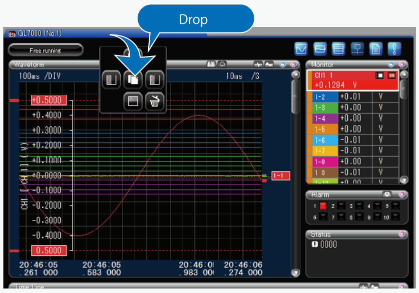
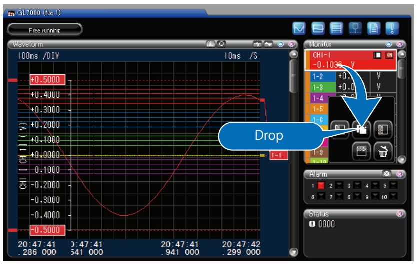
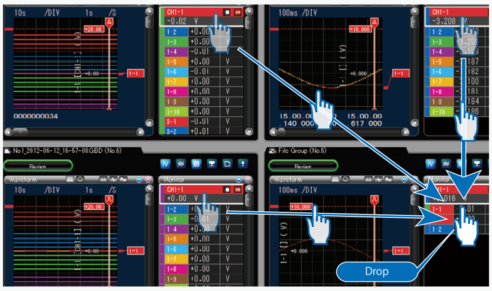
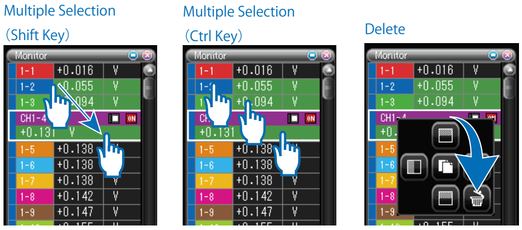
Drop the playback tab channel into the empty group.

Set as data playback group.



Free-rnning group cannot be mixed with data playback groups.

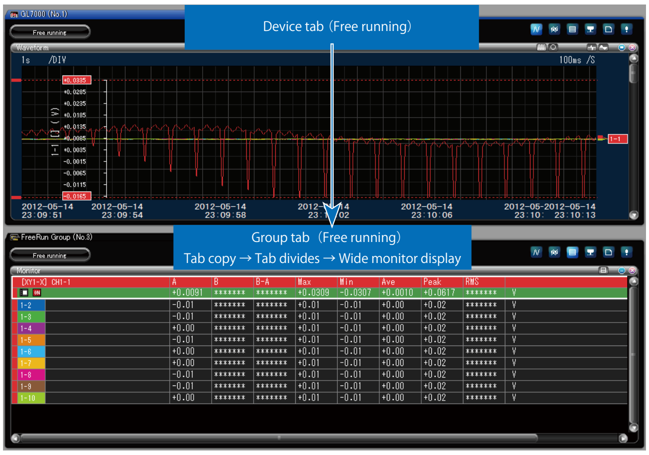
13-1-2. Method of group creation

Name	Explanation
Creates Open Free group	Open groups can be created from the action panel under the control panel.  Control panel MAIN Control panel Action Create empty tab MAIN Action Create gro
Creates from tab copy	Creates group tab by copying displayed tab. Copies monitor channel and waveform display information under the same requirements. Free-running/recording tab → free-running/recording tab Data playback tab → data playback group  The copied tabs are assigned new device numbers. For example "FreeRun Group (No.1)"
Creates from Monitor channel	Groups are created from the chosen monitor channel. Free-running/recording tab → free-running/recording tab Data playback tab monitor channel → data playback group  The copied tabs are assigned new device numbers. For example "FreeRun Group (No.1)"
Adds group tab monitor channels	Provided the group is of an identical family, it is possible to mix different tabs with the monitor channels. 
Deletes group tab monitor channels	Choose more than 1 monitor channel when deleting monitor channel group tabs. Can select multiple monitor channels separately by pressing the PC's shift key to select two points or by using the Ctrl key to select individually. Once they are selected, drag them to the recycle bin using the mouse.  Multiple Selection (Shift Key) Multiple Selection (Ctrl Key) Delete Monitor

13-1-3. Example of Group use

Here is an example using the group function.
* Group tab settings are not saved by this application or the GL device.

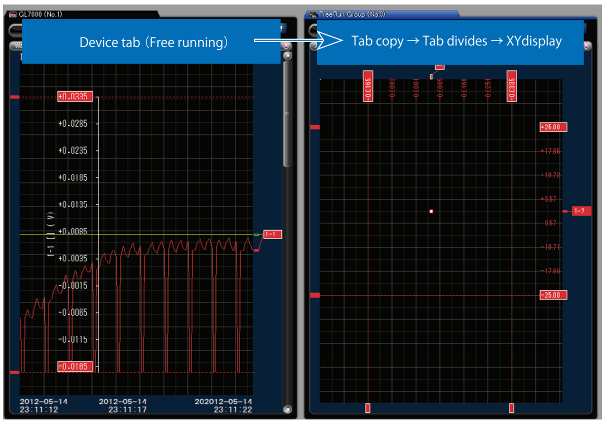
Example 1. Y-T Display and Wide Monitor Display


Device tab (Free running)
Group tab (Free running)
Tab copy → Tab divides → Wide monitor display
GL7000 (No.1)
FreeRun Group (No.3)
Free running
Monitor

[XY1-X] CH1-1	A	B	B-A	Max	Min	Ave	Peak	RMS	
☐ ON	+0.0091	*******	*******	+0.0309	-0.0307	+0.0010	+0.0617	*******	V
1-2	-0.01	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-3	-0.01	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-4	+0.00	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-5	-0.01	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-6	+0.00	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-7	+0.00	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-8	-0.01	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-9	-0.01	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V
1-10	+0.00	*******	*******	+0.01	-0.01	+0.00	+0.02	*******	V

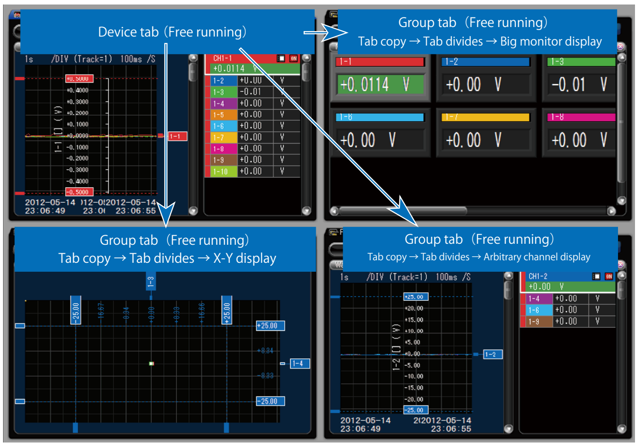
1) Copy the free running group tab and create a free running group.
2) Separate the free running group to the bottom
3) Wide monitor display for the free running group

Example 2. Y-T Display and X-Y Display


Device tab (Free running)
Tab copy → Tab divides → XYdisplay

1) Copy the free running group tab and create a free running group.
2) Separate the free running group to the right
3) Change the free running group to the X-Y display

Example 3. Only display Y-T display, X-Y display, Big Monitor display and Specified Monitor Channel


Device tab (Free running)
Group tab (Free running)
Tab copy → Tab divides → Big monitor display
Group tab (Free running)
Tab copy → Tab divides → X-Y display
Group tab (Free running)
Tab copy → Tab divides → Arbitrary channel display

1) Copy the free running group tab and create a free running group X3
2) Separate each group to the right, bottom, and bottom right
3) Change the first group to the big display by maximizing the monitor window
4) Change the second group to the X-T display
5) Delete unnecessary channels from the third group's monitor channel

13-2. Keyboard Shortcuts

Functions can be accessed quickly using the PC keyboard.

Function				Assigned Keys
10. Connection Screen			Screen Change	F2
	Control Panel		Device Search	F3
			LAN connection	F4
			Information	F12
Multi Screen			Screen Change	F2
			Open/Close Waveform Window	Ctrl + 1
			Open/Close Time Line Window	Ctrl + 2
			Open/Close Monitor Window	Ctrl + 3
			Open/Close Cursor Window	Ctrl + 4
			Open/Close Recording Information Window	Ctrl + 5
			Open/Close Alarm Window	Ctrl + 6
			Screen Horizontal Scroll	Ctrl + Left/Right
			Screen Horizontal Scroll (Big)	Ctrl + Shift + Left/Right
			Screen Vertical Scroll	Ctrl + Up/Down
			Screen Vertical Scroll (Big)	Ctrl + Shift + Up/Down
			Channel Change	Up/Down
			Channel Trace	Ctrl + T
	Control Panel	Settings	Settings	F5
		File Name	PC Playback	Ctrl + O
			Main Module Data	Ctrl + Shift + O
			Printing	Ctrl + P
		Waveform Operations	Whole Waveform Display (Waveform Window)	A
			Time/DIV (Waveform Window)	D/U
			Whole Waveform Display (Time Line Window)	Shift + A
			Time/DIV (Time Line Window)	Shift + D/U
			Span Change	1/2
			Position Change	3/4
			Stretch Change	5/6
			Stretch Position Change	7/8
		Action	Call Cursor A	Ctrl + A
			Call Cursor B	Ctrl Cursor Movement B
			Active Cursor Change	C
			Cursor Movement	Right/Left
			Cursor Movement (Big)	Shift + Right/Left
			Data Search	F3
			Create group tab	Ctrl + G
			Start recording	F7
			Stop Recording	F8

-Specifications are subject to change without notice.

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